

# Exhibit G

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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DYNATEMP INTERNATIONAL, INC. and FLUOROFUSION  
SPECIALTY CHEMICALS, INC.,  
Petitioner,

v.

R 421A LLC d/b/a CHOICE REFRIGERANTS,  
Patent Owner.

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IPR2020-01660  
Patent 9,982,179 B2

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Before GRACE KARAFFA OBERMANN, MICHELLE N. ANKENBRAND,  
and MONTÉ T. SQUIRE, *Administrative Patent Judges*.

SQUIRE, *Administrative Patent Judge*.

DECISION  
Denying Institution of *Inter Partes* Review  
35 U.S.C. § 314

## I. INTRODUCTION

Dynatemp International, Inc. and Fluorofusion Specialty Chemicals, Inc. (collectively, “Petitioner”) filed a Petition (Paper 4, “Pet.”) requesting the Board institute an *inter partes* review of claims 1–37 of U.S. Patent No. 9,982,179 B2 (Ex. 1001, “the ’179 patent”). Pet. 1. R 421A LLC d/b/a Choice Refrigerants (“Patent Owner”) filed a Preliminary Response (Paper 9, “Prelim. Resp.”). Prelim. Resp. 1. On our authorization, (Paper 13, “the March 11, 2021 Order”), Petitioner filed a Reply to the Preliminary Response (Paper 12, “Reply”) and Patent Owner filed a Sur-Reply (Paper 14, “Sur-Reply”).

We have authority under 35 U.S.C. § 314 to determine whether to institute an *inter partes* review, which provides that an *inter partes* review may not be instituted unless the information presented in the Petition shows that “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a); *see also* 37 C.F.R. § 42.4(a) (2020) (“The Board institutes the trial on behalf of the Director.”).

Having considered the Petition, Preliminary Response, Reply, and Sur-Reply, and evidence of record, for the reasons below, we exercise our discretion to deny institution of an *inter partes* review of the ’179 patent under 35 U.S.C. § 325(d).

## II. BACKGROUND

### A. *Real-Parties-In-Interest*

Petitioner identifies Dynatemp International, Inc. and Fluorofusion Specialty Chemicals, Inc., as the real parties-in-interest. Pet. 1. Patent Owner

identifies R 421A LLC and RMS of Georgia, LLC, as the real parties-in-interest. Paper 6, 2.

*B. Related Matters*

The parties identify the following pending district court actions involving the '179 patent as related matters: *R 421 LLC d/b/a Choice Refrigerants v. Dynatemp International, Inc.*, Civil Action No. 5:2020-cv-00147-FL (E.D.N.C.)<sup>1</sup> and *Dynatemp International, Inc. v. RMS of Georgia, LLC d/b/a Choice Refrigerants*, Civil Action No. 5:2020-cv-00142-FL (E.D.N.C.) (collectively, “the District Court Action”). Pet. 2; Paper 6, 1. Petitioner has also filed petitions challenging claims of other patents asserted in the District Court Action in IPR2021-00199 and PGR2021-00008. Pet. 2; Paper 6, 3.

*C. The '179 Patent (Ex. 1001)*

The '179 patent is titled “Refrigerant with Lubricating Oil for Replacement of R22 Refrigerant ” and issued May 29, 2018,<sup>2</sup> with claims 1–37. Ex. 1001, codes (54), (45), 10:2–14:21. The '179 patent is directed to an apparatus and method wherein potential ozone layer-damaging chlorodifluoromethane refrigerant (R-22) is substituted with a mix of less environmentally damaging refrigerants pentafluoroethane (R-125) and tetrafluoroethane (R-134a) in chlorodifluoromethane-based air-cooling systems. *Id.* at code (57), 1:18–22, 3:66–4:1.

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<sup>1</sup> Patent Owner indicates that Civil Action No. 5:2020-cv-00147-FL (E.D.N.C.) was administratively closed and consolidated with Civil Action No. 5:2020-cv-00142-FL on Oct. 23, 2020. Paper 6, 1.

<sup>2</sup> The '179 patent claims priority to a provisional application filed on September 8, 2003. Ex. 1001, code (60), 1:8–13.



The '179 patent discloses that the pentafluoroethane and tetrafluoroethane are mixed in a defined ratio such that the temperature-pressure relationship of the mixture approximates that of R-22, and the mixture is compatible with and can be used as a replacement for R-22. *Id.* at 1:22–27, 4:2–10, 4:19–25, code (57).

The '179 patent further discloses that the pentafluoroethane and tetrafluoroethane refrigerant is mixed with a soluble lubricating oil to provide lubrication to the refrigerating apparatus, and that the lubricant is soluble in and compatible with both the pentafluoroethane and tetrafluoroethane refrigerant mixture and R-22. *Id.* at 1:30–36, code (57). The '179 patent explains that because the lubricant is compatible with both the pentafluoroethane and tetrafluoroethane refrigerant mixture and R-22, it may be included with the pentafluoroethane and tetrafluoroethane refrigerant mixture and the mixture utilized in the refrigeration systems without deleterious effect upon moving parts of the refrigeration apparatus that require lubrication from the refrigerant. *Id.* at 4:10–18.

In an exemplary embodiment, the '179 patent describes a refrigerant composition having a ratio of about 42 weight percent pentafluoroethane to about 58 weight percent 1,1,1,2-tetrafluoroethane and including from about 0 to about 20 weight percent of a lubricating oil that is soluble in R-22, pentafluoroethane, and 1,1,1,2-tetrafluoroethane. *Id.* at 4:34–43.

*D. Illustrative Claim*

Petitioner challenges claims 1–37 of the '179 patent, of which claims 1, 8, 15, 21, 26, and 31 are independent. Pet. 1, 4–5, 17. Claim 1 is illustrative of the claimed subject matter and recites:

1. In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32° F. or a bubble point at about -41.5° F. at about one standard atmosphere of pressure,

wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41 % to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and

wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof, and the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.

Ex. 1001, 10:2–29.

*E. Asserted Evidence*

Petitioner relies on the following references in the asserted grounds of unpatentability:

Reference	Exhibit No. <sup>3</sup>
US 6,207,071 B1 (issued Mar. 27, 2001) (“Takigawa”)	1006
US 6,606,868 B1 (issued Aug. 19, 2003) (“Powell”)	1007
US 6,863,840 B2 (issued Mar. 8, 2005) (“Goble”)	1008
US 5,688,432 (issued Nov. 18, 1997) (“Pearson”)	1009
US 2003/0062508 A1 (published Apr. 3, 2003) (“Singh”)	1011
Federal Register, Vol. 71, No. 188 / Thursday, Sept. 28, 2006 / Rules and Regulations, 71 FR 56884–56893 (2006) (“Federal Register”)	1018
US 6,655,160 B2 (published Dec. 2, 2003) (“Roberts”)	1019
Lemmon et al., <i>Equations of State for Mixtures of R-32, R-125, R-134a, R-143a, and R-152a</i> , MS J. Phys. Chem. Ref. Data (Aug. 30, 2002) (“Lemmon”)	1020

Pet. 4–5, 17. Petitioner also relies on the declaration testimony of Dr. Eckhard Groll (Ex. 1013) in support of its contentions. *Id.* at 1, 21.

*F. Asserted Grounds of Unpatentability*

Petitioner contends the challenged claims are unpatentable based on the following grounds:<sup>4</sup>

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<sup>3</sup> For citations to Exhibits 1003, 1004, 1005, 1018, and 1020, we refer and cite to the page numbers added to the documents in the lower right side of each page.

<sup>4</sup> Regarding Ground 1 of the Petition (Pet. 4, 30), for purposes of this Decision, we refer to Petitioner’s challenge to claims 1–37 under § 103 as obvious over Goble, Singh, and Takigawa as asserted “Ground 1A” and the challenge to claims 21–37 under § 102 as anticipated by Goble as asserted “Ground 1B.”

Grounds	Claims Challenged	35 U.S.C. § <sup>5</sup>	References/Basis
1A	1–37	103	Goble, Singh, Takigawa
1B	21–37	102	Goble
2	1–37	103	Singh, Goble, Takigawa
3	1–37	103	Powell, Goble, Singh, Takigawa
4	1–37	103	Pearson, Goble, Singh, Takigawa
5	1–37	103	Federal Register, Goble, Singh, Takigawa
6	1–37	103	Roberts, Goble, Singh, Takigawa
7	1–37	103	Lemmon, Goble, Singh, Takigawa

Pet. 4–5.

### III. ANALYSIS

#### *A. Discretion Under 35 U.S.C. § 325(d)*

Section 325(d) provides that the Director may elect not to institute a proceeding if the challenge to the patent is based on matters previously presented to the Office. *Advanced Bionics, LLC v. Med-El*

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<sup>5</sup> The Leahy-Smith America Invents Act (AIA) includes revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. Pub. L. No. 112–29, §§ 3(b), 3(c), 3(n)(1), 125 Stat. 284, 287, 293 (2011). Because the application from which the ’179 patent issued was filed before March 16, 2013, we apply the pre-AIA versions of §§ 102, 103 to this Decision. Prelim. Resp. 5.

*Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 7 (PTAB Feb. 13, 2020) (precedential) (“*Advanced Bionics*”).<sup>6</sup> In evaluating matters under Section 325(d), the Board uses the following two-part framework: (1) first determining whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of the first part of the framework is satisfied, determining whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. *Id.* at 8.

*Advanced Bionics* further provides that:

Previously presented art includes art made of record by the Examiner, and art provided to the Office by an applicant, such as on an Information Disclosure Statement (IDS), in the prosecution history of the challenged patent. The proceedings in which the art was previously presented include, for example: examination of the underlying patent application, reexamination of the challenged patent, a reissue application for the challenged patent, and AIA post-grant proceedings involving the challenged patent.

*Id.* at 7–8.

We consider several non-exclusive factors as set forth in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph) (“*Becton, Dickinson*”), which “provide useful insight into how to apply the

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<sup>6</sup> The Board institutes trial on behalf of the Director. 37 C.F.R. § 42.4(a); *Advanced Bionics*, Paper 6 at 7 n.7.

framework” under Section 325(d). *Advanced Bionics*, Paper 6 at 9. These non-exclusive factors include:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
- (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;
- (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;
- (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and
- (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

*Becton, Dickinson*, Paper 8 at 17–18 (formatting added). “If, after review of factors (a), (b), and (d), it is determined that the same or substantially the same art or arguments previously were presented to the Office, then factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office.” *Advanced Bionics*, Paper 6 at 10.

Patent Owner argues that we should exercise our discretion under Section 325(d) to deny institution because the Petition relies on the same or substantially the same art that was previously presented to the Office and Petitioner has not demonstrated any material error by the Office during prosecution. Prelim. Resp. 1–2, 40–45. For example, Patent Owner contends that the Goble, Singh, Powell, and Pearson references were all previously presented to and considered by the Office. *Id.* at 1, 18, 21, 42. Patent Owner

further contends Takigawa was previously presented to and considered by the Office, including, for example, during prosecution of the '179 patent, where the Examiner rejected the claims under Section 103 as obvious over Takigawa. *Id.* at 39.

Patent Owner also contends Petitioner does not identify or sufficiently explain in the Petition how the Office materially erred. Prelim. Resp. 1–2 (arguing Petitioner does “not present any new evidence or reasons to show how the Office erred in the review of those references”), 44 (arguing Petitioner has “made no attempt in the Petition to explain how the Office erred in consideration of Singh, Powell, Goble, and Pearson”), 45 (arguing Petitioner has not “pointed out how [the Examiner] erred in evaluating the references”).

We note Petitioner does not specifically argue or address whether the asserted art is the same or substantially the same art that previously was presented to the Office. *See generally* Pet. Although Petitioner acknowledges that Takigawa, which is a reference Petitioner asserts in all but one of the grounds of unpatentability, was applied by the Examiner during prosecution of the '179 patent (Pet. 7 (admitting “[i]n the prosecution of the '179 Patent, a non-final rejection mailed March 25, 2013, rejected all the claims as obvious under 35 U.S.C. § 103 over Takigawa” and “the Takigawa reference had been applied in both the ['179 patent's] parent and grandparent applications”)), Petitioner does not explicitly state or meaningfully discuss whether any of the other asserted references were previously presented to or considered by the Office.

Rather, Petitioner argues the Examiner erred in a manner material to patentability by withdrawing the Section 103 rejection of the claims as

obvious over Takigawa based on the evidence of unexpected results submitted during prosecution. *See* Pet. 24–28. In particular, Petitioner contends that the evidence of unexpected results the applicant submitted and the Examiner considered during prosecution of the '179 patent, was insufficient to rebut the Examiner's *prima facie* case of obviousness based on Takigawa. *Id.* 25 (arguing “the results presented in the declaration fail to demonstrate an unexpected result”), 28 (arguing “the applicant of the '179 Patent failed to rebut a finding of *prima facie* obviousness”).

Having considered the parties' respective arguments, the evidence of record, and the facts and circumstances of this case, for the reasons below, we exercise our discretion to deny institution of trial under Section 925(d). Before turning to the *Advanced Bionics* two-part framework, we briefly discuss the asserted references and the relevant prosecution history of the '179 patent, including the '179 patent's parent and grandparent applications.

### *1. Asserted References*

#### *a. Takigawa*

Takigawa is a U.S. Patent titled “Fluid Composition Comprising HFC Refrigerant and Alkylbenzene-Based Refrigerator Oil” and issued March 27, 2001. Ex. 1006, codes (45), (54). Takigawa is directed to a fluid composition comprising an alkylbenzene refrigerator oil and a refrigerant containing 1,1,1,2-tetrafluoroethane and/or pentafluoroethane as a replacement for ozone-depleting chlorofluorocarbon and hydrochlorofluorocarbon refrigerants. *Id.* at 1:21–27, 1:11–19, 2:21–34.

Petitioner relies on Takigawa for disclosing a refrigerant composition containing 1,1,1,2-tetrafluoroethane and/or pentafluoroethane, with 1,1,1,2-tetrafluoroethane present in an amount of 40 weight percent or greater and



pentafluoroethane present in an amount of 40 weight percent or greater. Pet. 10, 28. Petitioner also relies on Takigawa for disclosing that lubricant is present in the composition up to about 20% by weight. *Id.* at 34.

*b. Powell*

Powell is a U.S. Patent titled “R 22 Replacement Refrigerant” and issued August 19, 2003. Ex. 1007, codes (45), (54). Powell is directed to a refrigerant composition comprising a hydrofluorocarbon component including 1,1,1,2-tetrafluoroethane and further comprising an additive selected from a saturated hydrocarbon or mixture thereof boiling in the range -5 to +70 °C, as a replacement for R-22 refrigerant. *Id.* at code (57), 1:6–12, 1:36–41.

Petitioner relies on Powell for disclosing that chlorine containing R-22 refrigerant must be phased out and utilizing a refrigerant mixture containing 1,1,1,2-tetrafluoroethane in an amount of 20–50% by weight and pentafluoroethane in an amount of 50–80% by weight. Pet. 19, 57–58.

*c. Goble*

Goble is a U.S. Patent titled “Nonflammable, Nonozone Depleting, Refrigerant Mixtures Suitable for Use in Mineral Oil” and issued March 8, 2005. Ex. 1008, codes (45), (54). Goble is directed to mixtures of refrigerants that may be substituted for flammable, ozone-depleting refrigerants, including R-22, and usable in mineral oil systems. *Id.* at code (57), 1:8–12, 1:36–41.

Petitioner relies on Goble for disclosing that chlorofluorocarbon refrigerants cause harm to the Earth’s ozone layer and an embodiment of a refrigerant mixture, which is roughly 56 weight percent pentafluoroethane and 44 weight percent 1,1,1,2-tetrafluoroethane. Pet. 18, 30–31. Petitioner

also relies on Goble for teaching the use of lubricating oils in such mixtures, including polyolefin oils and alkylbenzene oils. *Id.* at 32.

*d. Pearson*

Pearson is a U.S. Patent titled “Replacement Refrigerant Composition” and issued November 18, 1997. Ex. 1009, codes (45), (54). Pearson is directed to a refrigerant composition for use in a refrigeration apparatus as a replacement for chlorofluorocarbon refrigerants, such as R-22 refrigerant, the refrigerant composition comprising a mixture of pentafluoroethane, tetrafluoroethane, and a hydrocarbon selected from isobutene and propane, and optionally octafluoroethane. *Id.* at code (57), 1:25–29, 1:34–39, 1:43–51, 1:68–2:4, 2:59–64.

Petitioner relies on Pearson for disclosing replacing R-22 with a refrigerant mixture containing pentafluoroethane in an amount of 0.5–60% by weight and 1,1,1,2-tetrafluoroethane in an amount of 30–90% by weight and the addition of a hydrocarbon for use in refrigeration systems and equipment. Pet. 19, 67.

*e. Singh*

Singh is a U.S. Patent Application titled “Hydrofluorocarbon Refrigerant Compositions Soluble in Lubricating Oil” and published April 3, 2003. Ex. 1011, codes (43), (54). Singh is directed to hydrofluorocarbon refrigerant compositions soluble in hydrocarbon lubricating oils for use in replacing ozone-depleting chlorofluorocarbon and hydrochlorofluorocarbon compositions in refrigeration applications. *Id.* at code (57), ¶¶ 3, 10–13. In a preferred embodiment, Singh describes a refrigerant composition comprising pentafluoroethane, 1,1,1,2-tetrafluoroethane and cyclopentane refrigerants, and a lubricant selected from the group consisting of mineral oil,

alkylbenzene oil, white (paraffinic) oil, and mixtures of two or more thereof.  
*Id.* ¶¶ 10, 12, 20.

Petitioner relies on Singh for disclosing hydrofluorocarbon compositions to replace chlorine-containing refrigerants, including a preferred embodiment that comprises about 48 to about 80 parts by weight of pentafluoroethane and about 18 to about 60 parts by 1,1,1,2-tetrafluoroethane for use in refrigeration systems. Pet. 19, 46, 48. Petitioner also relies on Singh for teaching use of lubricants and additives, including alkylbenzene oil, in such compositions. *Id.* at 19, 48.

*f. Federal Register*

Federal Register is a copy of the “Protection of Stratospheric Ozone: Notice 21 for Significant New Alternatives Policy Program” at pages 56884–56891 of Volume 71 of the Federal Register (71 FR 56884–56891), which relates to and discusses a notice of acceptability that expands the list of acceptable substitutes for ozone-depleting substances under the U.S. Environmental Protection Agency’s (EPA) Significant New Alternatives Policy (SNAP) program for use in various sectors, including refrigeration and air conditioning, and states that the notice of acceptability is effective on September 28, 2006. Ex. 1018, 1.

Petitioner relies on Federal Register for disclosing that Patent Owner’s R-421A refrigerant is a blend of 58% by weight pentafluoroethane and 42% by weight 1,1,1,2-tetrafluoroethane. Pet. 20, 71.

*g. Roberts*

Roberts is a U.S. Patent titled “Refrigerant Compositions” and issued December 2, 2003. Ex. 1019, codes (45), (54). Roberts is directed to refrigerant compositions, which comprise:

(a) pentafluoroethane, octafluoropropane, trifluoromethoxydifluoromethane or hexa-cyclopropane, or a mixture of two or more thereof, in an amount of at least 35% based on the weight of the composition, (b) 1,1,1,2- or 1,1,2,2-tetrafluoroethane, trifluoromethoxypentafluoroethane, 1,1,2,3,3-heptafluoropropane or a mixture of two or more thereof, in an amount of at least 30% by weight based on the weight of the composition and (c) n-butane or isobutane, in an amount from 1% to less than 2.3% by weight based on the weight of the composition.

*Id.* at code (57), 2:9–25. Roberts discloses its refrigerant compositions for use as replacements in refrigeration equipment currently employing, or designed to employ, certain refrigerants, including R-22. *Id.* at 1:3–6.

Petitioner relies on Roberts for disclosing refrigerant compositions containing 35–60 wt. % pentafluoroethane and 35–60 wt. % 1,1,1,2-tetrafluoroethane, including a composition having 58.9 wt. % pentafluoroethane and 40.1 wt. % 1,1,1,2-tetrafluoroethane, as replacements in refrigeration equipment for R-22. Pet. 20, 71–73. Petitioner also relies on Roberts for disclosing use of lubricating oils and additives in its refrigerant compositions. *Id.* at 20, 73.

*h. Lemmon*

Lemmon is a manuscript of a paper to be submitted to the Journal of Physical and Chemical Reference Data titled, “Equations of State for Mixtures of R-32, R-125, R-134a, R-143a, and R-152a,” (Ex. 1020, 1), which Petitioner contends was published on August 30, 2002. Pet. 74. Lemmon is directed to mixture models developed to calculate the thermodynamic properties of refrigerant mixtures containing R-32, R-125, R-134a, R-143a, and R-152a, including a model that may be used to calculate dew and bubble point properties and critical points, within the

experimental uncertainties of the available measured properties of such mixtures. Ex. 1020, 2.

Petitioner relies on Lemmon for disclosing refrigerant mixtures of pentafluoroethane and 1,1,1,2-tetrafluoroethane where ranges of mole fractions of pentafluoroethane and 1,1,1,2-tetrafluoroethane were studied, including mixtures having mole fractions of pentafluoroethane and 1,1,1,2-tetrafluoroethane that encompass 0.545 pentafluoroethane and 0.455 1,1,1,2-tetrafluoroethane. Pet. 21, 74. Petitioner also relies on Lemmon for disclosing that the bubble point and dew point of such mixtures can be calculated. *Id.*

## *2. Relevant Prosecution History*

The '179 patent issued from Application No. 13/493,491, filed June 11, 2012, as a continuation of Application No. 12/961,045, filed December 6, 2010 (“the '045 parent application”), which is a continuation of Application No. 10/937,736, filed September 8, 2004 (“the '736 grandparent application”). Ex. 1001, codes (21), (22), (63), 1:7–11.<sup>7</sup> The '179 patent claims priority to and the benefit of Provisional Application No. 60/501,049, filed September 8, 2003 (“the '049 provisional”). *Id.* at code (60), 1:1–13.

During prosecution of the '179 patent, the Examiner rejected the claims under Section 103 as obvious over Takigawa, which is a reference the applicant presented to the Office on an IDS. Ex 1003, 264–270, 316; *see* Ex. 1001, code (56). In response to the rejection, the applicant submitted two declarations from inventor Kenneth M. Ponder as evidence supporting the

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<sup>7</sup> We observe that the same examiner conducted all of the examinations for these applications.

patentability of the '179 patent claims over Takigawa. Ex. 1003, 96–104 (Second Declaration of Kenneth M. Ponder), 253–256 (Declaration of Kenneth M. Ponder).

In particular, the Second Declaration of Kenneth M. Ponder included, among other evidence, data to show how the claimed refrigerant blend consisting of 58% pentafluoroethane and 42% 1,1,1,2-tetrafluoroethane unexpectedly outperforms a refrigerant blend consisting of 60% pentafluoroethane and 40% 1,1,1,2-tetrafluoroethane, which is within the range Takigawa discloses. *Id.* at 99.

Following the applicant's response, the Examiner withdrew the rejection of the claims under Section 103 as obvious over Takigawa (Ex. 1003, 41–46) and issued a Notice of Allowance (*id.* at 11–16). According to the Examiner's Search Notes, during prosecution of the '179 patent, the Examiner reviewed the prosecution histories of and prior art searches conducted for both the '045 parent application and '736 grandparent application. Ex. 1003, 16 (indicating the Examiner "[r]eviewed prosecution and searches in parent cases").

During prosecution of the '045 parent application, the Examiner rejected the claims under Section 103 as obvious over Takigawa. Ex. 1004, 63–69, 73–78; Ex. 1002, code (56). In response, the applicant amended the claims and submitted remarks, including analysis in support of the patentability of the claims over Takigawa. Ex. 1004, 34–47.

After considering the applicant's amendments and analysis in support of the patentability of the claims, the Examiner withdrew the § 103 rejection of those claims in view of Takigawa and issued a Notice of Allowance. *Id.* at 13–26. In the reasons for allowance, the Examiner explained:

The closest prior art of record is Takigawa, US 6,207,071. The reference discloses the utility of compositions comprising pentafluoroethane and tetrafluoroethane in amounts which make obvious those presently recited. However, the reference further discloses that naphthenic based lubricants and polyol esters were not satisfactory lubricants. As the present claims require those lubricants, they are not obvious over the prior art of record.

*Id.* at 26. According to the Examiner's Search Notes, during prosecution of the '045 parent application, the Examiner reviewed the prosecution history of the '736 grandparent application. *Id.* at 28 (denoting the Examiner "[r]eviewed prosecution of parent" on "6/01/11").

During prosecution of the '736 grandparent application, the applicant presented to the Office several prior art references on IDSs, including WO 01/23493 A1<sup>8</sup> (Ex. 1005, 349, 369–400, 483, 495–526) and EP 1 295 928 A2<sup>9</sup> (*id.* at 349, 404–411, 483, 487–493), both of which were considered by the Examiner, as evidenced by the Examiner's initials next to each reference on the IDS (*id.* at 349).

The Examiner also considered Takigawa during prosecution of the '736 grandparent application and rejected those claims under Section 103 as

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<sup>8</sup> WO 01/23493 A1 is a PCT International Application titled "R 22 Replacement Refrigerant" and published Apr. 5, 2001. Ex. 1005, codes (10), (12), (43), (54). It is the PCT counterpart to the Powell reference Petitioner asserts in the Petition. *Compare* WO 01/23493 A1 (Ex. 1005, 369–400), *with* Powell (Ex. 1007).

<sup>9</sup> EP 1 295 928 A2 is a European Patent Application titled "Hydrofluoro-carbon refrigerant compositions soluble in lubricating oil" and published Mar. 26, 2003. Ex. 1005, codes (11), (12), (43), (54). It is the European counterpart to the Singh reference Petitioner asserts in the Petition. *Compare* EP 1 295 928 A2 (Ex. 1005, 404–411), *with* Singh (Ex. 1011).

obvious over that reference. Ex 1005, 289–291, 295–299, 319–323, 540. After appealing the Examiner’s Section 103 rejection of those claims over Takigawa to the Board of Patent Appeals and Interferences (“BPAI”), which the BPAI affirmed in a Decision on Appeal mailed April 29, 2010 (“the BPAI Decision”), the patent applicant abandoned the ’736 grandparent application. *Id.* at 2, 84–93.<sup>10</sup>

In affirming the Examiner’s rejection of the ’736 grandparent application’s claims over Takigawa in that appeal, the BPAI agreed with the Examiner that the proffered evidence of unexpected results of record at the time was not persuasive because it did not compare the claimed invention to the closest prior art (i.e., Takigawa). *Id.* at 91.

*3. Whether the Same or Substantially the Same Art Was Presented to the Office*

We first consider whether Petitioner asserts the same or substantially the same art that previously was presented to the Office. *Advanced Bionics*, Paper 6 at 10. Petitioner’s asserted grounds of unpatentability rely on Goble, Singh, and Takigawa in Grounds 1A and Ground 2; Goble in Ground 1B; Powell, Goble, Singh, and Takigawa in Ground 3; Pearson, Goble, Singh, and Takigawa in Ground 4; Federal Register, Goble, Singh, and Takigawa in Ground 5; Roberts, Goble, Singh, and Takigawa in Ground 6; and Lemmon, Goble, Singh, and Takigawa in Ground 7. Pet. 4–5.

As we note above, Petitioner does not explicitly argue whether it asserts the same or substantially the same art that previously was presented to the Office. Petitioner acknowledges, however, that during prosecution of

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<sup>10</sup> A copy of the BPAI Decision is provided as Exhibit 1010.



the '179 patent, the Examiner rejected all of the claims under Section 103 as obvious over Takigawa. Pet. 7; Ex. 1003, 264–270, 316. Indeed, there is no dispute that Takigawa is listed on the cover page of the '179 patent as a reference cited by the Examiner. Ex. 1001, code (56). Additionally, the Examiner considered and rejected claims under Section 103 as obvious over the Takigawa reference during the prosecutions of both the '045 parent application (Ex. 1004, 63–69, 73–78) and the '736 grandparent application (Ex. 1005, 289–291, 295–299, 319–323, 540). Thus, in the absence of any counterargument from Petitioner, on this record, we are persuaded the Takigawa reference was previously presented to Office.

On this record, we are also persuaded that the Goble and Singh references are cumulative of art that was previously presented to the Office, namely Takigawa. During prosecution of the '179 patent, the Examiner relied on Takigawa for disclosing, among other claim limitations, a fluid composition comprising an alkylbenzene oil lubricant and a refrigerant containing 40 wt. % or more of 1,1,1,2-tetrafluoroethane and, most preferably, 40 wt. % or more of pentafluoroethane as a replacement for ozone-depleting chlorofluorocarbon and hydrochlorofluorocarbon refrigerants. Ex. 1003, 149–150.

Similarly, in asserted Grounds 1A, 1B, and 2, Petitioner relies on Goble for disclosing that chlorofluorocarbon refrigerants cause harm to the ozone layer and an embodiment of a refrigerant mixture, which is roughly 56 weight percent pentafluoroethane and 44 weight percent 1,1,1,2-tetrafluoroethane. Pet. 18, 30–31, 34–41. Petitioner also relies on Goble for teaching the use of lubricating oils in such mixtures, including polyolefin oils and alkylbenzene oils. *Id.* at 32, 34, 36, 40.

Likewise, in asserted Ground 2, Petitioner relies on Singh for disclosing the same or substantially the same claim limitations the Examiner relied upon Takigawa for disclosing during prosecution of the '179 patent. *Compare* Pet. 19, 46, 48, *with* Ex. 1003, 149–150. For example, Petitioner relies on Singh for disclosing hydrofluorocarbon compositions to replace chlorine-containing refrigerants, including a preferred embodiment that comprises about 48 to about 80 parts by weight of pentafluoroethane and about 18 to about 60 parts by 1,1,1,2-tetrafluoroethane for use in refrigeration systems. Pet. 19, 46, 48. Petitioner also relies on Singh for teaching use of lubricants and additives, including alkyl benzene oil, in such compositions. *Id.* at 19, 48.

Singh's disclosure also is substantially the same as the disclosure of EP 1 295 928 A2, which is Singh's European counterpart that was previously presented to the Office on an IDS during prosecution of the '736 grandparent application. *Compare* EP 1 295 928 A2 (Ex. 1005, 404–411), *with* Singh (Ex. 1011).

For similar reasons, we determine Powell also is cumulative of art that was previously presented to the Office. In asserted Ground 3, Petitioner relies on Powell for disclosing the same or substantially the same limitations the Examiner relied upon Takigawa for disclosing during prosecution of the '179 patent. *Compare* Pet. 19, 57–58, *with* Ex. 1003, 149–150.

In addition, Powell's disclosure is substantially the same as the disclosure of WO 01/23493 A1, which is the PCT counterpart of Powell and was previously presented to the Office on an IDS during prosecution of the '736 grandparent application. *Compare* WO 01/23493 A1 (Ex. 1005, 369–400), *with* Powell (Ex. 1007).

As to the remaining Pearson, Federal Register, Roberts, and Lemmon references Petitioner asserts in Grounds 4, 5, 6, and 7, respectively, we determine these references, too, are cumulative of art that was previously presented to the Office. As with Goble, Singh, and Powell, we determine Petitioner relies on each of Pearson, Federal Register, Roberts, and Lemmon as primary references in the asserted grounds for disclosing the same or substantially the same limitations the Examiner relied upon Takigawa for disclosing during prosecution of the '179 patent. *Compare* Pet. 19–21, 67, 71, 73, 74, *with* Ex. 1003, 149–150.

Thus, in view of the foregoing, we determine that the Petition asserts the same or substantially the same art that previously was presented to the Office.

*4. Whether the Office Erred in a Manner Material to Patentability*

Because we determine that the same or substantially the same art previously was presented to the Office, we turn next to whether Petitioner demonstrates that the Office erred in a manner material to the patentability of the challenged claims. *Advanced Bionics*, Paper 6 at 8, 10.

As we note above, Petitioner argues the Office erred in a manner material to patentability principally because it alleges the evidence of unexpected results Patent Owner submitted and the Examiner considered during prosecution of the '179 patent was insufficient to rebut the Examiner's obviousness rejection of the claims over Takigawa. Pet. 24–28.

Petitioner's argument focuses on alleged deficiencies in the Second Declaration of Kenneth M. Ponder (Ex. 1003, 96–104). Pet. 24. In particular, Petitioner contends that although the Second Declaration of Kenneth M. Ponder asserts that the 58/42 mixture unexpectedly better approximates the

pressure-temperature characteristics of R-22, “there was no data showing that this fit had a significant effect on actual performance.” *Id.* at 24.

Petitioner further contends the results in the Second Declaration of Kenneth M. Ponder fail to demonstrate an unexpected result because “[t]here is barely any difference” in the coefficient of performance (COP) for 60/40 and 58/42 mixtures over much of the temperature range. *Id.* at 25.

Petitioner contends that, in contrast to the data provided in the Second Declaration of Kenneth M. Ponder, a report submitted during prosecution of the ’736 grandparent application “showed no appreciable difference between the performance[s] of R421A against similar R22-substitute refrigerants” (Pet. 25) and “[t]here is no indication that the R421 COP is unexpectedly closer to the R22 COP” (*id.* at 26). Petitioner further contends that although “Applicants of the ’179 Patent argued that differences are indicated between 58/42 and 60/40 formulations . . . the Applicants made no observations as to whether these differences would have a significant effect on the performance of the refrigerant.” *Id.* at 27.

Petitioner also contends “the closest formulation in the newly found prior art is the 56% R125 and 44% R134 as set forth in Goble” and “there were no experimental results presented by the Applicant of the ’179 Patent for this formulation.” *Id.* 27–28 (relying on prior declarations submitted during prosecution of the ’736 grandparent application).

In response, Patent Owner maintains that Petitioner does not identify or sufficiently explain how the Office materially erred. Prelim. Resp. 1–2, 44, 45. In particular, Patent Owner explains that during prosecution of the ’179 patent, Patent Owner submitted the Second Declaration of Kenneth M. Ponder as evidence supporting the patentability of the ’179 patent claims

over the Examiner's obviousness rejection based on Takigawa. *Id.* at 18 (citing Ex. 1003, 96–104).

Patent Owner further explains that the Second Declaration of Kenneth M. Ponder included new evidence that was not previously presented to the Examiner in the earlier prosecutions of the '045 parent application and the '736 grandparent application. Prelim. Resp. 19. Patent Owner explains that, in contrast to the declaration evidence submitted during prosecution of the '736 grandparent application, the Second Declaration of Kenneth M. Ponder included, among other evidence, data to show how the claimed refrigerant blend consisting of 58% pentafluoroethane and 42% 1,1,1,2-tetrafluoroethane unexpectedly outperforms a refrigerant blend consisting of 60% pentafluoroethane and 40% 1,1,1,2-tetrafluoroethane, which is within the range Takigawa discloses. *Id.* at 19 (citing Ex. 1003, 99).

In particular, Patent Owner points to paragraph 9 of the Second Declaration of Kenneth M. Ponder, which states:

As shown, R-421A [58% R-125 / 42% R134a (58.0/42.0)] unexpectedly outperforms the 60% R-125 / 40% R134a (60.0/40.0)] composition for the full range, but its advantage grows at higher temperatures, namely when air conditioning and refrigeration loads increase (i.e., when most needed). The higher temperatures also are when utility demand rates kick in when applicable (normally for commercial and industrial but not for residential rates). Stated another way, **unexpectedly the “58/42” [R-421A (58% R125 / 42% R134a)] composition benefits are greatest when most needed** as compared to a 60% R125 / 40% R134a composition.

Ex. 1003, 99–100; *see also In re Chupp*, 816 F.2d 643, 646 (Fed. Cir. 1987) (explaining for composition claims that showing unexpected superiority for one property is sufficient to rebut a prima facie case of obviousness).

Patent Owner explains that, after the Second Declaration of Kenneth M. Ponder was submitted to and considered by the Examiner, the Examiner withdrew the Section 103 rejection of the claims as obvious over Takigawa and issued a Notice of Allowance, leading to the '179 patent. Pet. 20 (citing Ex. 1003, 11–53).

Having considered the parties' respective arguments and the prosecution history of the '179 patent, on this record, Petitioner does not show sufficiently that the evidence of unexpected results provided in the Second Declaration of Kenneth M. Ponder demonstrates that the Office erred in a manner material to patentability. Rather, we agree with Patent Owner that Petitioner does not identify or sufficiently explain how the Office materially erred. *See* Ex. 1003, 11–53, 96–104.

Petitioner's contentions regarding there being "barely any difference" in the COP for 60/40 and 58/42 mixtures over much of the temperature range (Pet. 25) and that "there was no data showing that this fit had a significant effect on actual performance" (*id.* at 24) are not persuasive because Petitioner does not adequately explain or identify persuasive evidence in the record sufficient to support them. Although Petitioner cites to Dr. Groll's Declaration, Dr. Groll essentially repeats Petitioner's contentions without providing any underlying data or further analysis. *Compare* Ex. 1013 ¶¶ 113–123, *with* Pet. 24–28.

Petitioner's contentions regarding a report and previous declarations submitted during prosecution of the '736 grandparent application and what those documents allegedly show (Pet. 25–26, 28) are not persuasive because Petitioner does adequately explain how they relate to the claimed compositions of the '179 patent or otherwise compare to the compositions,

data, and other evidence of unexpected results provided in the Second Declaration of Kenneth M. Ponder, and submitted to and considered by the Examiner during prosecution the '179 patent.

We do not find persuasive Petitioner's contention that "the closest formulation in the newly found prior art is the 56% R125 and 44% R134 as set forth in Goble" (Pet. 27) because Petitioner does not direct us to persuasive evidence in the record to support it. Other than citing to three lines of the Goble reference (*see id.* (citing Ex. 1008, 7:6–9)) and quoting a passage from the BPAI Decision unrelated to Goble (*id.* at 27–28), Petitioner does not provide an adequate explanation or direct us to evidence in the record sufficient to support this statement.

Moreover, we find Petitioner's contentions at pages 24–28 of the Petition amount essentially to a disagreement with the Examiner as to the sufficiency of the evidence of unexpected results provided in the Second Declaration of Kenneth M. Ponder to rebut the Examiner's obviousness rejection of the claims over Takigawa, which is an issue on which reasonable minds can disagree. *Advanced Bionics*, Paper 6 at 9 ("If reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability.").

Accordingly, on this record, we are not persuaded Petitioner has demonstrated the Office erred in a manner material to patentability.

#### 5. Conclusion as to § 325(d)

For the reasons discussed above, we exercise our discretion under 35 U.S.C. § 325(d) to deny institution of trial. Applying the *Advanced Bionics* two-part framework, we determine that the same or substantially the same

art was previously presented to the Office and that Petitioner has not demonstrated the Office erred in a manner material to the patentability of the challenged claims.

#### IV. CONCLUSION

For the foregoing reasons, we exercise our discretion under 35 U.S.C. § 325(d) to deny institution.

#### V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied as to all challenged claims of the '179 patent, and no trial is instituted; and

FURTHER ORDERED that Petitioner's request for authorization to withdraw Grounds 4, 5, and 7 of the Petition, as set forth in the March 11, 2021 Order (Paper 13), is denied as moot.



IPR2020-01660  
Patent 9,982,179 B2

For PETITIONER:

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<b>TO:</b> <b>Mail Stop 8</b> <b>Director of the U.S. Patent and Trademark Office</b> <b>P.O. Box 1450</b> <b>Alexandria, VA 22313-1450</b>	<b>REPORT ON THE</b> <b>FILING OR DETERMINATION OF AN</b> <b>ACTION REGARDING A PATENT OR</b> <b>TRADEMARK</b>
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of North Carolina on the following

☐ Trademarks or ☒ Patents. ( ☐ the patent action involves 35 U.S.C. § 292.)

DOCKET NO. 5:20-CV-147-M	DATE FILED 4/8/2020	U.S. DISTRICT COURT Eastern District of North Carolina
PLAINTIFF R421A LLC d/b/a Coice Refrigerants		DEFENDANT Dynatemp International, Inc., et al
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 9,982,179 B2	5/29/2018	Refrigerant with Lubricating Oil for Replacement of R22
2		
3		
4		
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY <input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
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CLERK PETER A. MOORE, JR.	(BY) DEPUTY CLERK <i>Samuel R. Smith, Deputy</i>	DATE 4/2/2020
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Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director  
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy



# UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	05/29/2018	9982179	821920-1032	1039

24504 7590 05/09/2018  
THOMAS | HORSTEMEYER, LLP  
3200 WINDY HILL ROAD, SE  
SUITE 1600E  
ATLANTA, GA 30339

## ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

### **Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)** (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Kenneth M. Ponder, Cumming, GA;  
Steffan Thomas JR., Buckhead, GA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit [SelectUSA.gov](http://SelectUSA.gov).

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

24504 7590 04/05/2018  
**THOMAS | HORSTEMEYER, LLP**  
**3200 WINDY HILL ROAD, SE**  
**SUITE 1600E**  
**ATLANTA, GEORGIA 30339**  
**UNITED STATES OF AMERICA**

**Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039

TITLE OF INVENTION: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
REGULAR	SMALL	\$500	\$0.00	\$0.00	\$500	07/05/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
HARDEE, JOHN R	1761	252-067000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Thomas | Horstemeyer, LLP

2 \_\_\_\_\_

3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☒ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

☐ A check is enclosed.

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☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 20-0778 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Todd Deveau/

Date April 24, 2018

Typed or printed name Todd Deveau

Registration No. 29,526

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	13493491			
<b>Filing Date:</b>	11-Jun-2012			
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder			
<b>Filer:</b>	Todd Deveau.			
<b>Attorney Docket Number:</b>	821920-1032			
Filed as Small Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
UTILITY APPL ISSUE FEE	2501	1	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Extension-of-Time:</b>				
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>500</b>

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	32432058
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau.
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	24-APR-2018
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	16:53:40
<b>Application Type:</b>	Utility under 35 USC 111(a)


### Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 500
RAM confirmation Number	042518INTEFSW16542501
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue_Fee_Transmittal.pdf	1011747	no	1
			6482cd6a183ad4a28badb10ca493deba601aaada		
<b>Warnings:</b>					
<b>Information:</b>					
2	Fee Worksheet (SB06)	fee-info.pdf	30279	no	2
			6dda80392a55c0b9334b8d23815591de838dceda		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			1042026		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					




<b>Issue Classification</b> 	<b>Application/Control No.</b> 13/493,491	<b>Applicant(s)/Patent Under Reexamination</b> Ponder et al.	
	<b>Examiner</b> JOHN R HARDEE	<b>Art Unit</b> 1761	

CPC						
Symbol					Type	Version
C09K	/	5	/	045	F	2013-01-01
C10M	/	171	/	008	I	2013-01-01
C09K	/	2205	/	22	A	2013-01-01
C09K	/	2205	/	43	A	2013-01-01
C10M	/	2203	/	1065	A	2013-01-01
C10M	/	2223	/	041	A	2013-01-01
C10N	/	2220	/	302	A	2013-01-01
F25B	/	2400	/	18	A	2013-01-01

CPC Combination Sets							
Symbol				Type	Set	Ranking	Version
	/		/				

NONE		<b>Total Claims Allowed:</b>	
(Assistant Examiner)	(Date)	37	
/JOHN R HARDEE/ Primary Examiner, Art Unit 1761	30 March 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1


<b>Issue Classification</b> 	<b>Application/Control No.</b> 13/493,491	<b>Applicant(s)/Patent Under Reexamination</b> Ponder et al.
	<b>Examiner</b> JOHN R HARDEE	<b>Art Unit</b> 1761

<b>INTERNATIONAL CLASSIFICATION</b>			
<b>CLAIMED</b>			
C09K	/	5	/ 04
<b>NON-CLAIMED</b>			
/		/	

<b>US ORIGINAL CLASSIFICATION</b>	
<b>CLASS</b>	<b>SUBCLASS</b>

<b>CROSS REFERENCES(S)</b>						
<b>CLASS</b>	<b>SUBCLASS (ONE SUBCLASS PER BLOCK)</b>					

NONE		<b>Total Claims Allowed:</b>	
(Assistant Examiner)	(Date)	37	
/JOHN R HARDEE/ Primary Examiner, Art Unit 1761	30 March 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

<b>Issue Classification</b> 	<b>Application/Control No.</b> 13/493,491	<b>Applicant(s)/Patent Under Reexamination</b> Ponder et al.
	<b>Examiner</b> JOHN R HARDEE	<b>Art Unit</b> 1761

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47															
<b>CLAIMS</b>															
<b>Final</b>	<b>Original</b>	<b>Final</b>	<b>Original</b>	<b>Final</b>	<b>Original</b>	<b>Final</b>	<b>Original</b>	<b>Final</b>	<b>Original</b>	<b>Final</b>	<b>Original</b>	<b>Final</b>	<b>Original</b>	<b>Final</b>	<b>Original</b>
1	30	10	39	13	48	25	57	34	66						
2	31	11	40	19	49	26	58	35	67						
8	32	-	41	7	50	27	59	36	68						
9	33	-	42	14	51	28	60	37	69						
15	34	-	43	20	52	29	61								
16	35	5	44	21	53	30	62								
17	36	12	45	22	54	31	63								
3	37	18	46	23	55	32	64								
4	38	6	47	24	56	33	65								

NONE  (Assistant Examiner) _____ (Date) _____		<b>Total Claims Allowed:</b> 37	
/JOHN R HARDEE/ Primary Examiner, Art Unit 1761 (Primary Examiner) _____ (Date) 30 March 2018		O.G. Print Claim(s) 1	O.G. Print Figure 1

## Bibliographic Data

Application No: 13493491

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged:

/jrh/

Examiner's Signature

Initials

Title:

REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT  
OF R22 REFRIGERANT

---

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/11/2012	252	1761	821920-1032
RULE			

### APPLICANTS

### INVENTORS

Kenneth M. Ponder, Cumming, GA, UNITED STATES

Steffan Thomas, Buckhead, GA, UNITED STATES

### CONTINUING DATA

This application is a CON of 12961045 12/06/2010 PAT 8197706

12961045 is a CON of 10937736 09/08/2004

10937736 has PRO of 60501049 09/08/2003

### FOREIGN APPLICATIONS

### IF REQUIRED, FOREIGN LICENSE GRANTED\*\*

06/19/2012

### STATE OR COUNTRY

UNITED STATES

### ADDRESS

THOMAS | HORSTEMEYER, LLP

3200 WINDY HILL ROAD, SE

SUITE 1600E

ATLANTA, GA 30339

UNITED STATES

### FILING FEE RECEIVED

\$530



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## NOTICE OF ALLOWANCE AND FEE(S) DUE

24504 7590 04/05/2018  
THOMAS | HORSTEMEYER, LLP  
3200 WINDY HILL ROAD, SE  
SUITE 1600E  
ATLANTA, GEORGIA 30339  
UNITED STATES OF AMERICA

EXAMINER

HARDEE, JOHN R

ART UNIT

PAPER NUMBER

1761

DATE MAILED: 04/05/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039

TITLE OF INVENTION: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
REGULAR	SMALL	\$500	\$0.00	\$0.00	\$500	07/05/2018

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

24504 7590 04/05/2018  
**THOMAS | HORSTEMEYER, LLP**  
**3200 WINDY HILL ROAD, SE**  
**SUITE 1600E**  
**ATLANTA, GEORGIA 30339**  
**UNITED STATES OF AMERICA**

**Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039

TITLE OF INVENTION: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
REGULAR	SMALL	\$500	\$0.00	\$0.00	\$500	07/05/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
HARDEE, JOHN R	1761	252-067000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039

24504 7590 04/05/2018  
THOMAS | HORSTEMEYER, LLP  
3200 WINDY HILL ROAD, SE  
SUITE 1600E  
ATLANTA, GEORGIA 30339  
UNITED STATES OF AMERICA

EXAMINER
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HARDEE, JOHN R

ART UNIT	PAPER NUMBER
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1761

DATE MAILED: 04/05/2018

## OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

### Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



<b>Notice of Allowability</b>	<b>Application No.</b> 13/493,491	<b>Applicant(s)</b> Ponder et al.	
	<b>Examiner</b> JOHN R HARDEE	<b>Art Unit</b> 1761	<b>AIA Status</b> No

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to applicant's TD and amendments.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 30-40 and 44-69. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

**Certified copies:**

a) ☐ All      b) ☐ Some      \*c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.  
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.


**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____. 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material _____. 4. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date. _____.	5. <input type="checkbox"/> Examiner's Amendment/Comment 6. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance 7. <input type="checkbox"/> Other _____.
--	---

/JOHN R HARDEE/  
Primary Examiner, Art Unit 1761

<b>Search Notes</b> 	<b>Application/Control No.</b> 13/493,491	<b>Applicant(s)/Patent Under Reexamination</b> Ponder et al.
	<b>Examiner</b> JOHN R HARDEE	<b>Art Unit</b> 1761

<b>CPC - Searched*</b>		
<b>Symbol</b>	<b>Date</b>	<b>Examiner</b>
C09K5/045; 2205/22; 2205/43	03/30/2018	JRH

<b>CPC Combination Sets - Searched*</b>		
<b>Symbol</b>	<b>Date</b>	<b>Examiner</b>

<b>US Classification - Searched*</b>			
<b>Class</b>	<b>Subclass</b>	<b>Date</b>	<b>Examiner</b>

\* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

<b>Search Notes</b>		
<b>Search Notes</b>	<b>Date</b>	<b>Examiner</b>
PALM invetor search. Reviewed prosecution history and searches in parent cases.	3/19/13	JRH
C09K5/045; 2205/22; 2205/43	03/30/2018	JRH

<b>Interference Search</b>			
<b>US Class/CPC Symbol</b>	<b>US Subclass/CPC Group</b>	<b>Date</b>	<b>Examiner</b>
C09K	5/045; 2205/22; 2205/43	03/30/2018	JRH

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Confirmation No.: 1039

*Ponder et al.*

Group Art Unit: 1761

Serial No.: 13/493,491

Examiner: Hardee, John R.

Filed: June 11, 2012

Docket No. 821920-1032

For: **REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22  
REFRIGERANT**

**RESPONSE TO NON-FINAL OFFICE ACTION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

The Non-final Office Action from Examiner John R. Hardee mailed on February 23, 2018 (Paper No./Mail Date 20180220A), has been received and reviewed. Applicant provides the following amendments and remarks in response

**AUTHORIZATION TO DEBIT ACCOUNT**

It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including, but not limited to, fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 20-0778.

**IN THE CLAIMS:**

1 – 29. (Cancelled)

30. (Currently Amended) In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure,

wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and

wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethanes wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof, and the tetrafluoroethane is 1,1,1,2- tetrafluoroethane.

31. (Previously Presented) In the apparatus of claim 30, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

32. (Currently Amended) A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute refrigerant composition designed to achieve a phase change and comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%,

(2) supplying the substitute refrigerant composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

(3) adding to said apparatus via the manifold the substitute refrigerant composition for chlorodifluoromethane, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof, and wherein the tetrafluoroethane is 1,1,1,2- tetrafluoroethane.

33. (Previously Presented) The method of claim 32, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

34. (Currently Amended) A refrigerant composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure,

wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and

wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof, and wherein the tetrafluoroethane is 1,1,1,2- tetrafluoroethane.

35. (Previously Presented) The refrigerant composition of claim 34, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

36. (Previously Presented) The refrigerant composition according to claim 34, wherein the lubricating oil includes an additive selected from the group consisting of further includes an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

37. (Previously Presented) In the apparatus of claim 30, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

38. (Previously Presented) In the apparatus of claim 30, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

39. (Previously Presented) The method according to claim 32, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

40. (Previously Presented) The method according to claim 32, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

41 – 43. (Canceled)

44. (Currently Amended) In the apparatus of claim ~~[[41]]30~~, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

45. (Currently Amended) The method according to claim ~~[[42]]32~~, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

46. (Currently Amended) The refrigerant composition according to claim ~~[[43]]34~~, wherein said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

47. (Previously Presented) In the apparatus of claim 30, wherein the blend exhibits a glide at about 9.5°F.

48. (Previously Presented) The method of claim 32, wherein the blend exhibits a glide at about 9.5°F.

49. (Previously Presented) The refrigerant composition of claim 34, wherein the blend exhibits a glide at about 9.5°F.

50. (New) In the apparatus of claim 30, wherein the blend exhibits a dew point of -32°F.
51. (New) The method of claim 32, wherein the blend exhibits a dew point of -32°F.
52. (New) The refrigerant composition of claim 34, wherein the blend exhibits a dew point of -32°F.
53. (New) In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and wherein the tetrafluoroethane is 1,1,1,2- tetrafluoroethane.
54. (New) In the apparatus of claim 53, wherein the blend exhibits a dew point of -32°F.
55. (New) In the apparatus of claim 53, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.
56. (New) In the apparatus of claim 53, wherein the blend exhibits a glide at about 9.5°F.
57. (New) In the apparatus of claim 53, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.



58. (New) A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute refrigerant composition designed to achieve a phase change and comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%,

(2) supplying the substitute refrigerant composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

(3) adding to said apparatus via the manifold the substitute refrigerant composition for chlorodifluoromethane, and wherein the tetrafluoroethane is 1,1,1,2- tetrafluoroethane.

59. (New) The method of claim 58, wherein the blend exhibits a dew point of -32°F.

60. (New) The method of claim 58, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

61. (New) The method of claim 58, wherein the blend exhibits a glide at about 9.5°F.

62. (New) The method according to claim 58, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

63. (New) A refrigerant composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the

tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and wherein the tetrafluoroethane is 1,1,1,2- tetrafluoroethane.

64. (New) The refrigerant composition of claim 63, wherein the blend exhibits a dew point of -32°F.

65. (New) The refrigerant composition of claim 63, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

66. (New) The method of claim 59, wherein the blend exhibits a glide at about 9.5°F.

67. (New) The refrigerant composition according to claim 63, wherein said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

68. (New) In the apparatus of claim 53, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

69. (New) The method according to claim 58, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

**REMARKS**

The Office Action presents two issues, namely: 1) an objection to claims 30-40 and 47-49; and 2) a non-statutory double patenting rejection based on US 8,197,706. Applicants thank the Examiner for the indication at page 4 that the claims would be allowable if the objection and double patenting rejection were overcome.

Claims 30-49 are pending. Claims 30, 32, 34 and 44-46 are amended herein. Claims 41-43 are cancelled. New claims 50-69 are presented. Upon entry of the present amendments, claims 30-40 and 44-69 would remain.

First, Applicants thank the Examiner for the indication of allowability of the claims 30-49, if the objection and the double patenting rejection were overcome.

In response to the objection, Applicants note the Examiner's comment at page 2 that: "there is no evidence of record that compositions containing 1,1,2,2-tetrafluoroethane can meet the physical limitations. Appropriate correction is required." In view of this kind suggestion, Applicants have amended herein claims 30, 32 and 34 to specify that the tetrafluoroethane is 1,1,1,2- tetrafluoroethane. Applicants submit that this amendment thereby traverses the objection.

In response to the double patenting rejection, Applicants submit herewith a Terminal Disclaimer referencing the US Patent 8,197,706 identified as the subject of the rejection. Applicants submit that this Terminal Disclaimer traverses this rejection.

Since these are the only two issues identified in connection with claims 30-49, Applicants submit that these claims are now in condition for allowance. In view of the amendment of claims 30, 32 and 34, Applicants have canceled claims 40-43 that specified that the tetrafluoroethane is 1,1,1,2-tetrafluoroethane. Applicants have also amended claims 44-46 to correct their dependency in view of the cancellation of claims 41-43.

New claims 50-69 are added. Claims 50-52 depend upon claims 30, 32, and 34, respectively, specifying wherein the blend exhibits a dew point of -32°F. Applicants submit claims 50-52 are allowable in view of the amendments to their base independent claims rendering their

base independent claims allowable. New independent claims 53, 58 and 63 are presented which are patterned after independent claims 30, 32 and 34 respectively specifying that the tetrafluoroethane is 1,1,1,2-tetrafluoroethane but removing from the claim that the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil. The remaining new claims 54-57, 59-62 and 64-69 are dependent upon new independent claims 53, 58 and 63, respectively. Applicants submit that these claims 53-69 are allowable for the same reasons as independent claims 30, 32 and 34 in that the specification that the tetrafluoroethane is 1,1,1,2-tetrafluoroethane appears to be the feature important in the Office Action to render the claims patentable in view of the evidence previously presented.

**CONCLUSION**

In light of the foregoing remarks and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed and that all pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

**THOMAS | HORSTEMEYER, LLP**

By: /Todd Deveau/  
**Todd Deveau**  
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## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	13493491			
<b>Filing Date:</b>	11-Jun-2012			
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder			
<b>Filer:</b>	Todd Deveau.			
<b>Attorney Docket Number:</b>	821920-1032			
Filed as Small Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
CLAIMS IN EXCESS OF 20	2202	7	50	350
INDEPENDENT CLAIMS IN EXCESS OF 3	2201	3	230	690
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>1040</b>

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	31991502
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau.
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	08-MAR-2018
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	09:26:25
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1040
RAM confirmation Number	030818INTEFSW09271200
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<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	Response_to_Non-final_OA.pdf	122515	no	11
			5e449f297cd6aae2292c5936479ff45e7fa713c2		
<b>Warnings:</b>					
<b>Information:</b>					
2	Fee Worksheet (SB06)	fee-info.pdf	31993	no	2
			9a63feed1b693bcf3babd45eab223bfc8e887b73		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			154508		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

<b>Doc Code: DIST.E.FILE</b> <b>Document Description: Electronic Terminal Disclaimer - Filed</b>		PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce
Electronic Petition Request	<b>TERMINAL DISCLAIMER TO OBIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT</b>	
Application Number	13493491	
Filing Date	11-Jun-2012	
First Named Inventor	Kenneth Ponder	
Attorney Docket Number	821920-1032	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT	
<input checked="" type="checkbox"/> Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action  <input checked="" type="checkbox"/> This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.		
Owner	Percent Interest	
Stefko Properties LLC	100%	
<p>The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)</p> <p>8197706</p> <p>as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.</p> <p>In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:</p> <ul style="list-style-type: none"> <li>- expires for failure to pay a maintenance fee;</li> <li>- is held unenforceable;</li> <li>- is found invalid by a court of competent jurisdiction;</li> <li>- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;</li> <li>- has all claims canceled by a reexamination certificate;</li> <li>- is reissued; or</li> <li>- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.</li> </ul> <p><input checked="" type="radio"/> Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.</p>		

<input type="radio"/> I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status:  <input checked="" type="radio"/> Small Entity  <input type="radio"/> Micro Entity  <input type="radio"/> Regular Undiscounted	
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES  I certify, in accordance with 37 CFR 1.4(d)(4) that I am:  <input checked="" type="radio"/> An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application  Registration Number <u>29526</u>  <input type="radio"/> A sole inventor  <input type="radio"/> A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application  <input type="radio"/> A joint inventor; all of whom are signing this request	
Signature	/Todd Deveau/
Name	Todd Deveau

\*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).  
 Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	13493491			
<b>Filing Date:</b>	11-Jun-2012			
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder			
<b>Filer:</b>	Todd Deveau.			
<b>Attorney Docket Number:</b>	821920-1032			
Filed as Small Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	160	160
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				160

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 13493491

Filing Date: 11-Jun-2012

Applicant/Patent under Reexamination: Ponder

Electronic Terminal Disclaimer filed on March 8, 2018

☒ APPROVED

**This patent is subject to a terminal disclaimer**

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	31991796
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau.
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	08-MAR-2018
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	10:01:10
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 160
RAM confirmation Number	030818INTEFSW10010700
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	33519	no	2
			6dca42ec4b125eea8aacff4523cfe6efb3a63cd9		
<b>Warnings:</b>					
<b>Information:</b>					
2	Fee Worksheet (SB06)	fee-info.pdf	30429	no	2
			3960da105c73fff8e859ad0acaead01a20305c93		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			63948		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



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<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875	Application or Docket Number <b>13/493,491</b>	Filing Date <b>06/11/2012</b>	<input checked="" type="checkbox"/> To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

**APPLICATION AS AMENDED – PART II**

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	03/08/2018	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 37	Minus	** 20	= 17	X \$50 =	850
	Independent (37 CFR 1.16(h))	* 6	Minus	***3	= 3	X \$230 =	690
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE						<b>1540</b>	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SLIE  
TONYA MCBRIDE

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039
24504	7590	02/23/2018	EXAMINER	
THOMAS   HORSTEMEYER, LLP			HARDEE, JOHN R	
3200 WINDY HILL ROAD, SE			ART UNIT	PAPER NUMBER
SUITE 1600E			1761	
ATLANTA, GEORGIA 30339			NOTIFICATION DATE	DELIVERY MODE
			02/23/2018	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@thomashorstemeyer.com  
ozzie.liggins@tkhr.com  
uspatents@tkhr.com



## DETAILED CORRESPONDENCE

### ***Notice of Pre-AIA or AIA Status***

1. The present application is being examined under the pre-AIA first to invent provisions.

### ***Claim Objections***

2. Claims 30-40 and 47-49 are objected to because of the following informalities: Compositions containing tetrafluoroethane are recited, along with some physical characteristics. Applicant has stated in the specification that “tetrafluoroethane” can refer to either 1,1,1,2-tetrafluoroethane or 1,1,2,2-tetrafluoroethane. There is no evidence of record that compositions containing 1,1,2,2-tetrafluoroethane can meet the physical limitations. Appropriate correction is required.

### ***Double Patenting***

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*,

686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit [www.uspto.gov/patent/patents-forms](http://www.uspto.gov/patent/patents-forms). The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to [www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp](http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp).

4. Claims 30-49 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-23 of U.S. Patent No. 8,197,706. Although the claims at issue are not identical, they are not patentably distinct from each other because the

patent claims compositions and methods using compositions consisting of pentafluoroethane and tetrafluoroethane, wherein the compositions have the same physical characteristics as those presently recited, with the same percentages of the refrigerants being recited in a dependent claim. The tetrafluoroethane may be R-134A.

***Allowable Subject Matter***

5. The claims would be allowable if the objection and the double patenting rejection were overcome.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, Dr. John R. Hardee, whose telephone number is (571) 272-1318. The examiner can normally be reached on Monday through Friday from 8:00 until 4:30. In the event that the examiner is not available, his supervisor, Mr. Harold Pyon, may be reached at (571) 272-1498.

7. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8100. Please note that examiners may not accept or enter faxed amendments.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

9. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/JOHN R HARDEE/  
Primary Examiner  
Art Unit 1761



EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	7912	(r hfc) adj "125" r125 hfc125 pentafluoroethane	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
L2	2057	"1,1,2,2-tetrafluoroethane"	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
L3	4733	(r hfc) adj "134" r134 hfc134	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
L4	9	"1" adj "1" adj "2" adj "2" adj tetrafluoroethane	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
L5	5584	L3 L4 L2	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
L6	1132	1 near4 L5	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:24
L7	914	1 near2 L5	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:25
L8	617	1 near L5	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:25
L9	276	8 AND ( C09K5/045 OR C09K2205/22).CPC. )	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:25
S2	9	"1" adj "1" adj "2" adj "2" adj tetrafluoroethane	US-PGPUB; USPAT	OR	OFF	2017/12/04 12:11
S4	4678	(r hfc) adj "134" r134 hfc134	US-PGPUB; USPAT	OR	OFF	2017/12/04 12:14
S5	9	"1" adj "1" adj "2" adj "2" adj tetrafluoroethane	US-PGPUB; USPAT	OR	OFF	2017/12/04 12:14
S6	4685	S4 S5	US-PGPUB; USPAT	OR	OFF	2017/12/04 12:14
S7	2057	"1,1,2,2-tetrafluoroethane"	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:22
S8	4733	(r hfc) adj "134" r134 hfc134	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:22
S9	9	"1" adj "1" adj "2" adj "2" adj tetrafluoroethane	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:22
S10	5584	S8 S9 S7	US-PGPUB; USPAT	OR	OFF	2018/02/21 09:22

2/21/2018 9:31:39 AM  
C:\Users\jhardee\Documents\EAST\Workspaces\493491.wsp

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

# Request for Continued Examination (RCE) Transmittal

Address to:  
Mail Stop RCE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Application Number	13/493,491
Filing Date	June 11, 2012
First Named Inventor	Kenneth M. Ponder
Art Unit	1761
Examiner Name	John R. Hardee
Attorney Docket Number	821920-1032

## This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

- Submission required under 37 CFR 1.114** Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

  - ☒ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.
    - ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on \_\_\_\_\_
    - ☐ Other \_\_\_\_\_
  - ☒ Enclosed
    - ☐ Amendment/Reply
    - ☐ Affidavit(s)/ Declaration(s)
    - ☐ Information Disclosure Statement (IDS)
    - ☒ Other Petition for 1-mth Extension of Time
- Miscellaneous**

  - ☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of \_\_\_\_\_ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)
  - ☐ Other \_\_\_\_\_
- Fees**

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 20-0778.

  - ☒ RCE fee required under 37 CFR 1.17(e)
    - ☒ Extension of time fee (37 CFR 1.136 and 1.17)
    - ☐ Other \_\_\_\_\_
  - ☐ Check in the amount of \$ \_\_\_\_\_ enclosed
  - ☒ Payment by credit card (Form PTO-2038 enclosed)

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

### SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/Todd Deveau/	Date	February 8, 2018
Name (Print/Type)	Todd Deveau	Registration No.	29,528

### CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature			
Name (Print/Type)		Date	

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

## Instruction Sheet for RCEs

(not to be submitted to the USPTO)

### NOTES:

An RCE is not a new application, and filing an RCE will not result in an application being accorded a new filing date.

#### **Filing Qualifications:**

The application must be a utility or plant application filed on or after June 8, 1995. The application cannot be a provisional application, a utility or plant application filed before June 8, 1995, a design application, or a patent under reexamination. See 37 CFR 1.114(e).

#### **Filing Requirements:**

***Prosecution in the application must be closed.*** Prosecution is closed if the application is under appeal, or the last Office action is a final action, a notice of allowance, or an action that otherwise closes prosecution in the application (e.g., an Office action under *Ex parte Quayle*). See 37 CFR 1.114(b).

***A submission and a fee are required at the time the RCE is filed.*** If reply to an Office action under 35 U.S.C. 132 is outstanding (e.g., the application is under final rejection), the submission must meet the reply requirements of 37 CFR 1.111. If there is no outstanding Office action, the submission can be an information disclosure statement, an amendment, new arguments, or new evidence. See 37 CFR 1.114(c). The submission may be a previously filed amendment (e.g., an amendment after final rejection).

### WARNINGS:

#### **Request for Suspension of Action:**

All RCE filing requirements must be met before suspension of action is granted. A request for a suspension of action under 37 CFR 1.103(c) does not satisfy the submission requirement and does not permit the filing of the required submission to be suspended.

#### **Improper RCE will NOT toll Any Time Period:**

***Before Appeal*** - If the RCE is improper (e.g., prosecution in the application is not closed or the submission or fee has not been filed) and the application is not under appeal, the time period set forth in the last Office action will continue to run and the application will be abandoned after the statutory time period has expired if a reply to the Office action is not timely filed. No additional time will be given to correct the improper RCE.

***Under Appeal*** - If the RCE is improper (e.g., the submission or the fee has not been filed) and the application is under appeal, the improper RCE is effective to withdraw the appeal. Withdrawal of the appeal results in the allowance or abandonment of the application depending on the status of the claims. If there are no allowed claims, the application is abandoned. If there is at least one allowed claim, the application will be passed to issue on the allowed claim(s). See MPEP 1215.01.

**See MPEP 706.07(h) for further information on the RCE practice.**

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>		Docket Number (Optional) <b>821920-1032</b>
Application Number <b>13/493,491</b>	Filed <b>June 11, 2012</b>	
For <b>REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT</b>		
Art Unit <b>1761</b>	Examiner <b>John R. Hardee</b>	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	Micro Entity Fee	
<input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ <u>100</u>
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ _____
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ _____
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____

☒ Applicant asserts small entity status. See 37 CFR 1.27.☐ Applicant certifies micro entity status. See 37 CFR 1.29.  
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.☐ A check in the amount of the fee is enclosed.☒ Payment by credit card. Form PTO-2038 is attached.☐ The Director has already been authorized to charge fees in this application to a Deposit Account.☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to  
Deposit Account Number 20-0778.☒ Payment made via EFS-Web.**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant.☒ attorney or agent of record. Registration number 29,526.☐ attorney or agent acting under 37 CFR 1.34. Registration number \_\_\_\_\_./Todd Deveau/

Signature

February 8, 2018

Date

Todd Deveau

Typed or printed name

770-933-9500

Telephone Number

**NOTE:** This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below\*.☐ \* Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	13493491			
<b>Filing Date:</b>	11-Jun-2012			
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder			
<b>Filer:</b>	Todd Deveau.			
<b>Attorney Docket Number:</b>	821920-1032			
Filed as Small Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 1 month with \$0 paid	2251	1	100	100
<b>Miscellaneous:</b>				
RCE- 2ND AND SUBSEQUENT REQUEST	2820	1	950	950
<b>Total in USD (\$)</b>				<b>1050</b>



## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	31735213
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau.
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	08-FEB-2018
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	11:08:53
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1050
RAM confirmation Number	020818INTEFSW11093401
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	1032RCE.pdf	185952	no	3
			f018aa1de9a605c3f5d4c2b779d2c0cfd30e5c85		
<b>Warnings:</b>					
This is not a USPTO supplied RCE SB30 form.					
<b>Information:</b>					
2	Extension of Time	EOT.pdf	152185	no	2
			0a521741a0df3aa3e5bb4f9d90af4eae69f52482		
<b>Warnings:</b>					
<b>Information:</b>					
3	Fee Worksheet (SB06)	fee-info.pdf	32331	no	2
			78488335bc49c3ccad0a4300334d2fc14e80f9aa		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			370468		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

# AFCP 2.0 Decision

Application No.

13/493,491

Applicant(s)

Ponder et al.

Examiner

JOHN R HARDEE

Art Unit

1761

AIA Status

No

This is in response to the After Final Consideration Pilot request filed 21 December 2017.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

- ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.
- ☐ A non-broadening amendment to at least one independent claim was not submitted.
- ☐ A proper AFCP 2.0 request was submitted in response to the most recent final rejection.
- ☐ Other: \_\_\_\_\_

## 2. Proper Request

A. After final amendment submitted with the request will not be treated under AFCP 2.0.

The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

- ☒ The after final amendment will be treated under pre-pilot procedure.

B. Updated search and/or completed additional consideration.

The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

- ☐ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.
- ☐ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action.  
See attached interview summary for further details.
- ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.
- ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.
- ☐ 5. Other: \_\_\_\_\_

Examiner Note: Please attach an interview summary when necessary as described above.



# UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039
24504	7590	01/19/2018	EXAMINER	
THOMAS   HORSTEMEYER, LLP			HARDEE, JOHN R	
3200 WINDY HILL ROAD, SE			ART UNIT	PAPER NUMBER
SUITE 1600E			1761	
ATLANTA, GEORGIA 30339			NOTIFICATION DATE	DELIVERY MODE
			01/19/2018	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@thomashorstemeyer.com  
ozzie.liggins@tkhr.com  
uspatents@tkhr.com

<b>Advisory Action</b> <b>Before the Filing of an Appeal Brief</b>	<b>Application No.</b> 13/493,491	<b>Applicant(s)</b> Ponder et al.	
	<b>Examiner</b> JOHN R HARDEE	<b>Art Unit</b> 1761	<b>AIA Status</b> No

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 21 December 2017 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

**NO NOTICE OF APPEAL FILED**

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.

b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires \_\_\_\_\_ months from the mailing date of the prior Advisory Action or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

*Examiner Note:* If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANTS FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**NOTICE OF APPEAL**

2. ☐ The Notice of Appeal was filed on \_\_\_\_\_. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37CFR 41.37(a).

**AMENDMENTS**

3. ☒ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because

a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);

b) ☐ They raise the issue of new matter (see NOTE below);

c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: See below. (See 37CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicants reply has overcome the following rejection(s): \_\_\_\_\_

6. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☐ For purposes of appeal, the proposed amendment(s): (a) ☐ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

**AFFIDAVIT OR OTHER EVIDENCE**

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_

9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

**REQUEST FOR RECONSIDERATION/OTHER**

12. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: \_\_\_\_\_

13. ☐ Note the attached Information *Disclosure Statement(s)*. (PTO/SB/08) Paper No(s). \_\_\_\_\_

14. ☒ Other: See Continuation Sheet.

**STATUS OF CLAIMS**

15. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: \_\_\_\_\_  
 Claim(s) objected to: \_\_\_\_\_  
 Claim(s) rejected: 30-49  
 Claim(s) withdrawn from consideration: \_\_\_\_\_

/JOHN R HARDEE/ Primary Examiner, Art Unit 1761	
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Continuation of AMENDMENTS: There is no Second Declaration of Kenneth Ponder of record prior to the declaration submitted on 12/21/17. The first mention of any second declaration appears to be in applicant's response of 9/28/17. The examiner appears to have referred to the first declaration, that of 8/13/13, as the second, adopting applicant's characterization. The examiner cannot have previously considered a declaration which was never submitted. The examiner apologizes for the mischaracterization and subsequent confusion. The voluminous data present in the declaration of 12/21/17, the first appearance in the record of the Second Declaration, are more than can be accommodated under the After Final Consideration Program. An RCE would be appropriate for this amount of data.

01/15/2018

Doc Code: A.NE.AFCP

Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

<b>CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0</b>		
<b>Practitioner Docket No.:</b> <b>821920-1032</b>	<b>Application No.:</b> <b>13/493,491</b>	<b>Filing Date:</b> <b>June 11, 2012</b>
<b>First Named Inventor:</b> <b>Kenneth M. Ponder</b>	<b>Title:</b> REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT	
<p>APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.</p> <ol style="list-style-type: none"> <li>1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (<i>e.g.</i>, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).</li> <li>2. The above-identified application contains an outstanding final rejection.</li> <li>3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.</li> <li>4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.</li> <li>5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.</li> <li>6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).</li> <li>7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, <i>e.g.</i>, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]</li> <li>8. By filing this certification and request, applicant acknowledges the following:               <ul style="list-style-type: none"> <li>• Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.</li> <li>• The examiner will verify that the AFCP 2.0 submission is compliant, <i>i.e.</i>, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:                   <ul style="list-style-type: none"> <li>○ The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, <i>e.g.</i>, by mailing an advisory action.</li> <li>○ If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.                       <ul style="list-style-type: none"> <li>▪ The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.</li> <li>▪ If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.</li> </ul> </li> </ul> </li> </ul> </li> </ol>		
<b>Signature</b> /Todd Deveau/	<b>Date</b> December 21, 2017	
<b>Name</b> (Print/Typed) <b>Todd Deveau</b>	<b>Practitioner</b> <b>Registration No.</b> <b>29,526</b>	
<b>Note:</b> This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.		
<input checked="" type="checkbox"/> * Total of <u>1</u> forms are submitted.		

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Confirmation No.: 1039

*Ponder et al.*

Group Art Unit: 1761

Serial No.: 13/493,491

Examiner: Hardee, John R.

Filed: June 11, 2012

Docket No. 821920-1032

For: **REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22  
REFRIGERANT**

**RESPONSE TO FINAL OFFICE ACTION AND REQUEST FOR CONSIDERATION UNDER  
THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

The final Office Action from Examiner John R. Hardee mailed on October 12, 2017 (Paper No./Mail Date 20171004), has been received and reviewed. Applicant submits herewith its Certification and Request for Consideration Under the After Final Consideration Pilot Program 2.0 [Form PTO/SB/434 (05-13)]. Applicant provides the following remarks in response and in support of its Request.

**AUTHORIZATION TO DEBIT ACCOUNT**

It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including, but not limited to, fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 20-0778.

**IN THE CLAIMS:**

1 – 29. (Cancelled)

30. (Previously presented) In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure,

wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and

wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethanes wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

31. (Previously Presented) In the apparatus of claim 30, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

32. (Previously Presented) A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute refrigerant composition designed to achieve a phase change and comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%,

(2) supplying the substitute refrigerant composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

(3) adding to said apparatus via the manifold the substitute refrigerant composition for chlorodifluoromethane, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

33. (Previously Presented) The method of claim 32, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

34. (Previously Presented) A refrigerant composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the

ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure,

wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and

wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

35. (Previously Presented) The refrigerant composition of claim 34, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

36. (Previously Presented) The refrigerant composition according to claim 34, wherein the lubricating oil includes an additive selected from the group consisting of further includes an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

37. (Previously Presented) In the apparatus of claim 30, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

38. (Previously Presented) In the apparatus of claim 30, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.
39. (Previously Presented) The method according to claim 32, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.
40. (Previously Presented) The method according to claim 32, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.
41. (Previously Presented) In the apparatus of claim 30, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
42. (Previously Presented) The method of claim 32, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
43. (Previously Presented) The refrigerant composition of claim 34, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
44. (Previously Presented) In the apparatus of claim 41, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

45. (Previously Presented) The method according to claim 42, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

46. (Previously Presented) The refrigerant composition according to claim 43, wherein said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

47. (Previously Presented) In the apparatus of claim 30, wherein the blend exhibits a glide at about 9.5°F.

48. (Previously Presented) The method of claim 32, wherein the blend exhibits a glide at about 9.5°F.

49. (Previously Presented) The refrigerant composition of claim 34, wherein the blend exhibits a glide at about 9.5°F.

**REMARKS**

The Office Action presents a single issue, namely: claims 30-49 stand rejected under 35 USC 103(a) as obvious in view of US 6,207,071 (Takigawa et al.).

Claims 30-49 are pending.

First, Applicants thank the Examiner for the interview and issuance of the Interview Summary on December 5, 2017. Applicants note the kind suggestion for the filing of an RCE in the Interview Summary. However, there appears to be some confusion and inconsistencies between statements in the Non-final Office Action issued May 28, 2017, the Final Office Action issued October 12, 2017 and the Interview Summary. Thus, the Applicants feel the need to comment prior to taking further action.

The Non-final Office Action issued March 28, 2017 in Section 3, page 3-4 in responding to Applicants' prior comments stated:

*Applicant's arguments filed February 28, 2017 have been fully considered but they are not persuasive. Arguments regarding chlorofluorocarbon substitutes versus hydrochlorofluorocarbons substitutes are well taken. As a courtesy to applicant, this action is NOT FINAL. Nonetheless, the reference does provide motivation to experiment within a relatively narrow range to find suitable hydrochlorofluorocarbons substitutes. The examiner has not argued, nor does he believe that all compositions falling within this narrow range will behave identically. This is the purpose of experimentation, and the motivation provided in the reference is more explicit than an "obvious to try" standard. The reference implicitly discloses a refrigerant composition consisting of 40% of 1,1, 1,2-tetrafluoroethane and 60% of pentafluoroethane at col. 8, line 39. This is the closest prior art. If applicant believes that compositions according to the current claims provide unexpected benefits over this composition, such should be demonstrated via timely filed declaration. Attorney arguments cannot take the place of evidence.*

In view of the comments in the Non-final Office Action that: "If Applicant believes that compositions according to the current claims provide unexpected benefits over this composition [the composition of the Takigawa reference], such should be demonstrated via timely filed Declaration. Any Attorney arguments cannot take the place of evidence", Applicants submitted their Response dated September 28, 2017 with which Applicants attempted to include the Second Declaration of Kenneth M. Ponder. It does not appear, however, that the Declaration

found its way into the Offices Electronic Records. The Second Declaration of Kenneth M. Ponder demonstrates the unexpected benefits over the cited reference, in particular the allegedly implicitly disclosed 40% 1,1,1,2-tetrafluoroethane (R-134a) and 60% pentafluoroethane (R-125).

The Final Office Action issued October 12, 2017 provides merely the following comment found in Section 4, pages 2-3 in reply to Applicants' submission:

*Applicant's arguments filed September 28, 2017 have been fully considered but they are not persuasive. Applicant's arguments largely repeat those answered in the previous office action and remain non-persuasive for the reasons of record. Applicant argues that the Takigawa reference does not provide any teaching or suggestion on how to select a refrigerant composition to serve as a substitute specifically for R-22. This is not persuasive because the rejection was made for obviousness, not anticipation. Again, the examiner has not argued that all 40:60 to 60:40 mixtures of R-125 and R-134a will behave identically. The reference provides this relatively narrow window in which to experiment. Reproduction of the content of the declarations of Kenneth Ponder is appreciated. This information has been considered and commented upon previously. Applicant's citation of case law is well taken. Perhaps the issue is ripe for appeal and for additional guidance to be provided to both the examiner and the attorney by the PTAB.*

The Interview Summary, however, comments:

*"Noting that the application was after final, the examiner called Mr. Deveau to discuss the need for an interview. A declaration containing additional data which was prepared by the applicant is not present in the electronic file wrapper. The declaration may have been lost by the Office, or applicant may have forgotten to submit it with the response to the rejection of March 28, 2017. Upon consultation with his supervisor, the examiner called back to say that filing an RCE would be appropriate prior to filing the declaration".*

Applicants appreciate the suggestion in the Interview Summary, but note that as stated in the Final Office Action: "Reproduction of the content of the Declarations of Kenneth Ponder is appreciated. This information has been considered." (Emphasis Added). Accordingly, there should be no need to file an RCE when the content of the Declaration that is the subject of the Interview Summary is stated by the Examiner to have already been considered.

Applicants further note the statement in the Final Office Action that "this information has been considered and commented on upon previously." Applicants respectfully submit this information while stated to have been considered, has not been commented upon previously other



than by the cursory statements in paragraphs 3 of the Non-final Office Action and 4 of the Final Office Action. Applicants respectfully submit that the response to arguments in both Final Office Actions does not address the points raised, particularly those raised in Applicants' Response filed on September 28, 2017 in response to the Non-final Office Action.

Applicants cannot find where the Examiner has addressed or commented upon:

- 1) the unexpected benefits of the present refrigerant;
- 2) that unexpectedly adjusting the present refrigerant blend so that the dew point more closely matches that of R-22 for which it is to serve as a substitute negatively impacts the GWP of the Applicants' blend;
- 3) where in Takigawa any teaching or suggestion can be found for determining a refrigerant blend that can serve as a substitute for HCFC-22 (R-22);
- 4) that the Examiner, while asserting that Takigawa provides motivation to experiment within "the relatively narrow range of 40:60 to 60:40 pentafluoroethane to tetrafluoroethane, fails to identify any purpose or objective allegedly taught by Takigawa for such blind experimentation;
- 5) that a range of 40:60 to 60:40 is not at all a "relatively narrow range";
- 6) that various refrigerant blends within the 40:60 to 60:40 range are not suitable as substitutes for various types of refrigerants including, in particular, HCFC-22; and
- 7) why one might select a dew point for a refrigerant blend that does not approximate that of the refrigerant for which it is to act as a substitute, among other arguments.

Applicants respectfully request reconsideration and, if not withdrawal of the rejection, at least entry of this Response and the Second Declaration of Kenneth M. Ponder for the purposes of appeal based upon the amendments and remarks presented herein.

The presently pending claims are directed to a refrigerant consisting of a blend of tetrafluoroethane and pentafluoroethane to be a substitute for chlorodifluoromethane (HCFC-22). For example, claim 30 recites "the improvement comprising substituting the

chlorodifluoromethane (HCFC-22) with a refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at 1 standard atmosphere pressure, wherein in the substitute refrigerant pentafluoroethane is present in an amount of 59% to 57% by weight and tetrafluoroethane is present in an amount of 41 % to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and tetrafluoroethane totaling 100%.

Claim 31, for example, recites the blend of refrigerant gases exhibits both a dew point at about -32°F and a bubble point at about -41.5°F.

The Declaration demonstrates the unexpected benefits provided by the above referenced refrigerant composition of the present claims. They show that the refrigerant recited in the present claims more closely approximates characteristics of HCFC-22 than the 60/40 composition previously relied upon by the Examiner as the closest prior art, particularly within the temperature range most needed for the refrigerant.

Additionally, the evidence shows that while the bubble point closely approximates that of HCFC-22, the dew point does not and that unexpectedly adjusting the refrigerant blend so that the dew point of the refrigerant blend more closely approximates that of HCFC-22 negatively impacts the Global Warming Potential (GWP) of the blend. Moreover, the present refrigerant blend while having been determined by the trade associations as an acceptable substitute for HCFC-22, it is not an acceptable substitute for refrigerant R-11.

Further, Applicants note the statement in the Final Office Action that:

*"Applicant argues that the Takigawa reference does not provide any teaching or suggestion on how to select a refrigerant composition to serve as a substitute specifically for R-22. This is not persuasive because the rejection was made for obviousness, not anticipation".*

Applicants respectfully submit that this statement is nonsensical. In particular, when a rejection is made for obviousness, there must be some teaching or suggestion found in the prior art to modify the teachings of the prior art to meet all of the elements of a claim. This statement, in effect, concedes that Takigawa does not provide any such teaching or suggestion in regards to finding or determining a substitute for R-22 to reach the refrigerant composition of the present claims.

Further, Applicants have previously pointed out that Takigawa fails to provide any teaching for identifying or determining a substitute refrigerant for R-22. Moreover, Takigawa fails to teach or suggest referring to or using either or both bubble point and/or dew point for determining a substitute for R-22. The response by the Office evades these arguments by simply stating incorrectly that it is not necessary to find any such teaching or suggestion.

Instead, the response in the Non-final Office Action asserts that Takigawa provides “motivation to experiment within a relatively narrow range”. However, the Office Actions fail to comment or explain where the motivation to experiment comes from. Stated another way, what purpose can the Office point to in Takigawa for such “motivation to experiment”? Applicants submit that experimentation for experimentation sake - without any purpose or objective - fails to meet the evidence required to support a rejection for obviousness.

Further, the Final Office Action appears to clarify that the reference to experimentation “within a relatively narrow range” is within the range of 40:60 to 60:40 mixtures of R-125 and R-132A”. Applicants have shown, however, that the trade does not consider a range of from 40:60 to 60:40 to be a “relatively narrow range”. In fact, the trade considers this is unacceptably large range when refrigerants are defined by percentages of, for example,  $\pm 1\%$  and not an overall range of 20%.

Additionally, the evidence shows that refrigerants within such range of 40:60 to 60:40 would not behave identically, nor could they be expected to behave in a particular manner. For example, refrigerant blends within such range may be found to be acceptable as a substitute for

one type of refrigerant but not another type of refrigerant. More particularly, the evidence shows that there are refrigerants that could be considered within the range of 40:60 to 60:40 that are not suitable as substitutes for R-22.

Moreover, the Office Action relies on a blind “obvious to try” standard since it can point to nowhere in Takigawa where there is any suggestion as what one may be trying to achieve by such asserted “obvious to try” experimentation. Without evidence of motivation for the objective of finding a substitute for R-22, Takigawa cannot serve as a basis for “obvious to try” where the objective is unknown.

Stated another way, the Office Action has not stated what result-effective parameters are to be considered or involved in carrying out the blind “obvious to try” experimentation over a variation of 20% other than to find out if all compositions over the range of 20% would behave identically. This, however, would not lead one to determine an acceptable substitute for HCFC-22. Instead, such experimentation would only determine whether one composition within the 20% range behaves identically to another composition within the 20% range. The Examiner concedes, however, that not all refrigerant blends within the 20% range would be considered to behave identical. Then what is the purpose for the alleged “obvious to try” experimentation? Without the hindsight guidance of Applicants’ specification why would one conduct such experimentation?

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as “a routine experimentation”. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Only result-effective variables can be optimized. The Office has failed to address this point. It has failed to describe what features are result-effective variables in finding an acceptable substitute for HCFC-22 as they are used in the claimed subject matter. Specifically, the Office has failed to state what the recognized result that is to be achieved. In addition, the Office does not provide any support for the assertion that these features are routinely optimized as is used in the claims. Rather the Office makes a conclusory assertion that

the amounts can be optimized without a reasonable argument to support its position. Thus, the Office has not met its prima facie case of obviousness. Accordingly, the claims are novel and non-obvious over Takigawa.

More particularly, Applicants presented remarks in their Response to the Non-Final Office Action supported by the Second Declaration of Kenneth Ponder showing just this. As demonstrated by those arguments and the Second Declaration of Kenneth Ponder and as previously argued and presented, the composition of the present claims is designated by ASHRAE as R421a consisting of 58% (+1.0 – 1.0%) and 42% R134a (+1.0, -1.0%). Furthermore, ASHRAE's designation providing formulation tolerances of +/-1% for each of the 2 components shows that the composition referenced in the Office Action of 60% pentafluoroethane and 40% tetrafluoroethane does not fall within ASHRAE's designation nor within ASHRAE's formulation tolerances for the present R421a showing that ASHRAE considers a composition of 60% R125 and 40% R134a to be distinct from the present R421a.

Furthermore, as noted in the remarks in Applicants' Response to the Non-Final Office Action the present R421a composition offers a much closer approximation of the thermodynamic HCFC-22 (R22) pressure-temperature characteristics than the 60%/40% composition asserted to be taught by Takigawa and that such is an important consideration for replacement of HCFC-22 in for retrofit and specifically for thermostatic valve control of refrigerant flow metering and air conditioning and refrigeration machinery. In short, unexpectedly, R421a better approximates the pressure-temperature characteristics of HCFC-22 than a composition of 60% R-125 and 40% R134a. Furthermore, the R124a out performs a blend of 60% R125a and 40% R134a for average condensing temperatures. Additionally, the advantage of R421a over a 60/40% composition grows at higher temperatures, namely, when air conditioning and refrigeration modes increased, i.e., when they are most needed. Stated another way, **unexpectedly the "58/42" [R-421A (58% R125 / 42% R134a)] composition benefits are greatest when most needed** as compared to a

60% R125 / 40% R134a composition. See, Second Declaration of Kenneth Ponder, paragraphs 5-9.

These arguments are supported by the evidence submitted in Applicants last Response and by way of the Second Declaration of Kenneth Ponder. Additionally, just to be clear, these arguments are repeated, in part, below.

Previously submitted with the Supplemental IDS herewith are copies of the EPA's listing of Substitute Refrigerants Under SNAP as of October 4, 2011 that provides a list of acceptable substitutes for Class I (CFCs) under the SNAP program as of October 4, 2011 and the EPA's Summary of Substitute Refrigerants Listed in SNAP Notice 25 providing a listing of refrigerant substitutes for HCFC-22 (chlorodifluoromethane). Comparing the two lists one finds the following comparison of many refrigerants that are listed as a suitable replacement for one but not the other. Examples are provided in Tables 1 and 2 below.

Table 1  
In Air Conditioning

	CFC	HCFC-22
HCFC 123	Yes	No
HCFC 125	Yes	No
HFC 236	Yes	No
R-290	No	Yes
R401A,B	Yes	No
R404A	No	Yes
R-406A	Yes	No
R407A	No	Yes
R409A	Yes	No
R410A,B	No	Yes
R416A	No	No
R417A	No	Yes
R421A	No	Yes
R422B	No	Yes
R424A	No	Yes

Table 2  
In Commercial Refrigeration

	CFC	HCFC-22
HCFC 22	Yes	No
HCFC 152B	No	Yes
HFC 236	Yes	No
R290	No	Yes
R401A,B	Yes	No
R402A,B	Yes	No
R406A	Yes	No
R408A	Yes	No
R409	Yes	No
R410A,B	No	Yes
R411A,B	Yes	No
R416A	No	No
R417A	No	Yes
R421A	No	Yes
R422B	No	Yes
R424A	No	Yes

Thus, just because a refrigerant may be suitable or acceptable as a replacement for some CFC refrigerant, that neither Takigawa - nor the Examiner - identifies, does not automatically render it suitable for replacement of an HCFC refrigerant, and vice versa. In fact R416A (134a/125/600 in the ratio 59.0 (+0.5, -1.0)/39.5 (+1.0,-0.5)/1.5 (+1.0,-0.5) is not listed as a suitable replacement for either CFC-11 or HCFC-22. Further, there is simply no teaching or suggestion for such in Takigawa. This demonstrates the unpredictability in the art.



Attached hereto is a Table 7 including a listing of the refrigerants that are primarily offered in competition to my R-421A refrigerant along with their respective dew points and bubble points. The bubble point and dew point for HCFC-22 are -41.46 and -41.46°F, respectively. While the bubble point for my R-421A refrigerant closely approximates that of HCFC-22, the blend dew point does not; yet as shown above my R-421A refrigerant performs surprisingly well as a substitute for HCFC-22. In fact, the inventors found that to adjust the ratio of R125 and R134a in their refrigerant blend away from its 58%  $\pm$  1.0% R125 and 42%  $\pm$  1.0% R134a so the dew point more closely matches the dew point of HCFC-22 would negatively impact the aforementioned Global Warming Potential (GWP). See, Second Declaration of Kenneth Ponder, paragraph 14.

Moreover referring again to the "Summary of Substitute Refrigerants Listed in SNAP Notice 25," Applicants previously noted to the Office that their present invention has received SNAP approval as a replacement for HCFC-22, but not CFC-11. The Summary includes a Table of SNAP approved refrigerant substitutes for HCFC-22 (chlorodifluoromethane) that lists approximately 45 to 50 differing refrigerant blends that are all approved substitutes for HCFC-22, including Applicants' present invention. This SNAP listing refutes the Examiner's reliance on the present invention being a "mere" optimization of the teachings of Takigawa, or stated in another way that it is simply "obvious to try" the teachings of Takigawa to arrive at the present invention. In view of the number of refrigerants listed as acceptable substitutes it appears the odds would be extremely low that one would arrive at Applicants' refrigerant based on Takigawa. See, Second Declaration of Kenneth Ponder, paragraph 11.

Included in this SNAP listing are numerous blends of refrigerants that comprise pentafluoroethane (R-125) and tetrafluoroethane (R-134A). Further, many of such refrigerants include pentafluoroethane in a range between 60 to 40% and tetrafluoroethane in a range of 40 to 60% such as: 1) R125/R290/R134A/R600A in a ratio of 55.01/1/42.5/1.5% by weight; 2) R32/R125/R134A in a ratio of 20/40/40% by weight (known as R407A); 3) R125/R134A/R600A in a ratio of 46.6/50.0/3.4% by weight (R417A); 4) R125/R134A/R600A in a ratio of 55.0/42.0/3.0

(R422B); 5) R125/R134A/R600A/R600/R601A in a ratio of 50.5/47.0/0.9/1.0/0.6% by weight (R424A); and 6) R125/R134A in a ratio of 50/50% by weight (R507A). As seen by the ASHRAE “R” designations, each of these refrigerant blends or compositions is considered by ASHRAE to be a different refrigerant offering properties different from those of the other ASHRAE designated refrigerants. See, Second Declaration of Kenneth Ponder, paragraph 12.

In Honeywell International Inc. v. Mexichem Amanco Holding S.A.D.E.C.V. et al., Appeal No. 2016-1996, August 1, 2017) the Federal Circuit Court of Appeals reviewed and rejected arguments presented by the U.S. Patent and Trademark Office, Patent Trial and Appeal Board, in which the Board found on reexamination claims to a refrigerant namely, 1,1,1,2-tetrafluoropropene (HFO-1234YF) unpatentable on grounds that are basically the same as those presented in the present Office Action. In Honeywell, the Federal Circuit found that the Board committed legal error by improperly relying on inherency to find obviousness of the claims. Additionally, the Federal Circuit found error by the Board, while noting the overall unpredictability in the refrigerant art, the Board asserted that “routine testing” would have led to the discovery of the claimed refrigerant. The Federal Circuit rejected the Board’s assertion concerning “routine testing” and reversed the rejection of the claims. The Board noted:

“A further point regarding so-called “routine testing” is that § 103 provides that “[p]atentability shall not be negated by the manner in which the invention was made.” 35 U.S.C. § 103 (2012). That provision was enacted to ensure that routine experimentation does not necessarily preclude patentability. See, e.g., *In re Saether*, 492 F.2d 849, 854 (C.C.P.A. 1974) (“In his argument that ‘mere routine experimentation’ was involved in determining the optimized set of characteristics, the solicitor overlooks the last sentence of 35 U.S.C. § 103...Here we are concerned with the question of whether the claimed invention would have been obvious at the time it was made to a person having ordinary skill in the art-not how it was achieved.” (internal citation omitted)); *In re Fay*, 347 F.2d 597, 602 (C.C.P.A. 1965) (“[W]e do not agree that ‘routine experimentation’ negatives patentability. The last sentence of section 103 states that ‘patentability shall not be negated by the manner in which the invention was made.’”).

Thus, as shown herein, the Examiner's reliance on the statement: "The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified" in Takigawa is not correct. As shown, Applicants' recited composition does not have properties similar to those compositions which according to the Examiner would also be exemplified in *Takigawa et al.*

### **CONCLUSION**

In light of the foregoing remarks and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed and that all pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

**THOMAS | HORSTEMEYER, LLP**

By: /Todd Deveau/

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# ATTACHMENT OF TABLE 7

Comparative Properties and Efficiency of R-421A for Retrofit Use to Replace R-22  
James M. Cain, Engineering Consultant, USA

JMC/RMS-1312s  
2013.12.26

Table 7: Data for Selected Refrigerants (IP units)

properties	R-22	R-407C	R-410A	R-421A	R-422B	R-422D	R-427A	R-438A
molar mass (lb/mol)	0.190628	0.190046	0.180023	0.240359	0.239242	0.242386	0.199385	0.218476
normal boiling point (NBP)								
bubble point for blends (°F)	-41.46	-46.53	-60.60	-41.22	-42.36	-45.76	-46.33	-44.18
blend dew point (°F)	-41.46	-33.63	-60.60	-51.66	-52.59	-37.01	-33.16	-53.05
maximum temperature glide								
at NBP (°F)	0.000	12.587	0.142	9.569	9.769	8.747	12.164	11.340
at 68 °F (°F)	0.000	19.065	0.209	6.582	6.234	6.373	9.323	8.605
density at NBP								
saturated liquid (lb/ft <sup>3</sup> )	87.97	86.19	84.36	91.19	87.28	87.81	86.46	86.64
saturated vapor (lb/ft <sup>3</sup> )	0.2836	0.2861	0.2606	0.3731	0.3632	0.3718	0.3030	0.3319
latent heat of vaporization								
at NBP (Btu/lb)	100.6	107.2	117.4	82.5	84.2	81.6	101.8	92.8
at NBP (Btu/lb) vapor	29.53	36.38	39.60	30.76	36.58	30.40	30.83	30.89
at 140 °C (Btu/lb)	90.20	56.29	45.23	41.46	41.76	37.94	53.00	47.28
saturated vapor pressure								
at 68 °F (psia)	132.8	127.7	209.3	119.0	120.7	131.1	124.2	122.8
at 140 °F (psia)	352.1	366.8	566.1	338.3	340.3	364.3	355.0	349.7
critical point								
temperature (°F)	228.1	169.8	169.4	191.0	191.8	179.2	188.0	169.0
pressure (psia)	725.7	671.4	710.9	588.4	574.0	565.3	637.0	624.3
specific volume (ft <sup>3</sup> /lb)	0.0306	0.0331	0.0349	0.0291	0.0304	0.0303	0.0327	0.0314
ozone depletion potential (ODP) relative to R-11								
scientific	0.04	0	0	0	0	0	0	0
regulatory (MP)	0.055							
global warming potential (GWP) for 100 yr (TH)								
scientific relative to CO <sub>2</sub>	1760	1700	2100	2600	2500	2700	2100	2200
ASHRAE 34 / ISO 817 safety classification	A1	A1	A1	A1	A1	A1	A1	A1
ASHRAE 34 Refrigerant Concentration Limit (RCL) BS/MdF	13	18	25	17	16	16	16	4.9

The grey regions of Table 6 and Table 7 indicate inapplicable data, namely the absence of composition-based glide based for the single-compound R-22. They also signify inapplicable data for blends not directly regulated by ozone depletion potential (ODP) in international treaties (notably the Montreal Protocol) and most regulations, though regulatory consequences result indirectly based on mass-weighted formulations of the blends.

<b>CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0</b>		
<b>Practitioner Docket No.:</b> <b>821920-1032</b>	<b>Application No.:</b> <b>13/493,491</b>	<b>Filing Date:</b> <b>June 11, 2012</b>
<b>First Named Inventor:</b> <b>Kenneth M. Ponder</b>	<b>Title:</b> <b>REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT</b>	
<p>APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.</p> <ol style="list-style-type: none"> <li>1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (<i>e.g.</i>, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).</li> <li>2. The above-identified application contains an outstanding final rejection.</li> <li>3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.</li> <li>4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.</li> <li>5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.</li> <li>6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).</li> <li>7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, <i>e.g.</i>, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]</li> <li>8. By filing this certification and request, applicant acknowledges the following:               <ul style="list-style-type: none"> <li>• Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.</li> <li>• The examiner will verify that the AFCP 2.0 submission is compliant, <i>i.e.</i>, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:                   <ul style="list-style-type: none"> <li>○ The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, <i>e.g.</i>, by mailing an advisory action.</li> <li>○ If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.                       <ul style="list-style-type: none"> <li>▪ The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.</li> <li>▪ If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.</li> </ul> </li> </ul> </li> </ul> </li> </ol>		
<b>Signature</b> <b>/Todd Deveau/</b>	<b>Date</b> <b>December 21, 2017</b>	
<b>Name</b> <b>(Print/Typed) Todd Deveau</b>	<b>Practitioner</b> <b>Registration No. 29,526</b>	
<b>Note:</b> This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.		
<input checked="" type="checkbox"/> * Total of <u>1</u> forms are submitted.		

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

#### Summary of Substitute Refrigerants Listed in SNAP Notice 25

The table below provides additional information on the substitutes listed as acceptable in the end uses within the refrigeration and air conditioning sector noted in SNAP Notice 25. The first column provides the name of the substitute. Where available, we have listed the refrigerant using the ASHRAE designation (available at <http://www.ashrae.org/technology/page/1933#mo>). Alternate names or trade names, along with the Chemical Abstract Service Registry Number (CAS ID#), are in the second column. The third column refers to the previous *Federal Register* actions in which we found the substitute acceptable for one or more end uses within the refrigeration and air conditioning sector. The fourth through eighth columns provide information about the environmental, health, and safety properties. “ODP” is the ozone depletion potential of the substitute, relative to a value of 1.0 for CFC-11. “GWP” is the 100-year integrated global warming potential of a chemical or the weighted average of the GWPs of the chemicals in a blend, relative to a value of 1 for CO<sub>2</sub>. (Technically, GWP only applies to individual chemicals; however, for a blend, an average weighted by the percentage composition provides a rough approximation of a blend’s impact.) “VOC status” indicates whether the substitute contains any components that are defined as, or are exempt from the definition of, volatile organic compounds under Clean Air Act regulations (see 40 CFR 51.100(s)) addressing the development of SIPs to attain and maintain the national ambient air quality standards. Substitutes listed as “exempt” in the VOC status column contain only components that are not VOCs or that are exempt from the definition of VOC under those regulations. “Flammable” indicates whether the refrigerant is flammable, either through an ASHRAE classification of “2” or “3” in ASHRAE 34, or by flashpoint testing using ASTM E 681. Flammable refrigerants are hazardous waste and must be disposed of consistent with regulations under the Resource Conservation and Recovery



Act (RCRA). "Exposure limit" indicates the workplace exposure limits for the components of the refrigerant, typically as an 8-hour time-weighted average. "Type of exposure limit" indicates the source of the exposure limit, such as a Permissible Exposure Limit (PEL) from the U.S. Occupational Safety and Health Administration (OSHA), a Recommended Exposure Limit (REL) from the National Institutes of Occupational Safety and Health (NIOSH), a Threshold Limit Value (TLV) from the American Conference of Government Industrial Hygienists (ACGIH), a Workplace Environmental Exposure Limit (WEEL) from the American Industrial Hygiene Association (AIHA), an acceptable exposure limit from the substitute's manufacturer (manufacturer AEL), a Continuous Exposure Guidance Level (CEGL) from the National Research Council (NRC), or a recommendation from EPA (either a workplace acceptable exposure limit – AEL – or consumer exposure limit – CEL).

**Summary of Information on Refrigerant Substitutes for HCFC-22 and  
Blends Containing HCFC-22 and/or HCFC-142b (see Notice 25 for specific end uses allowed)**

Name of Substitute	Further Identification Information for Substitute <sup>1</sup>	Previous SNAP Federal Register Listings	ODP	GWP <sup>2</sup>	VOC status	Flammable	Exposure limits <sup>3</sup> (ppm)
Ammonia absorption; Ammonia/water absorption; Ammonia vapor compression/ secondary loop	NH <sub>3</sub> ; R-717; CAS ID # 7664-41-7	March 18, 1994 rule, 59 FR 13044; Notice 3, July 28, 1995; 60 FR 38729; Notice 5, September 5, 1996, 61 FR 47011	0	0	exempt	yes (ASHRAE class 2)	Ammonia: 50 (PEL)
C6 perfluoroketone	1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone or FK-5-1-12my2; CAS ID # 756-13-8; Novec <sup>TM</sup> 649	Notice 24, September 30, 2009, 74 FR 50129	0	0.6-1.8	VOC	no	150 (Manufacturer AEL)
Cryogenic system using recaptured liquid CO <sub>2</sub> or liquid nitrogen		Notice 11, December 6, 1999, 64 FR 68039	0	N/A	exempt	no	N/A
Desiccant cooling		March 18, 1994 rule, 59 FR 13044; Notice 5, September 5, 1996, 61 FR 47011	0	N/A	N/A	N/A	N/A
Evaporative cooling		March 18, 1994 rule, 59 FR 13044; Notice 5, September 5, 1996, 61 FR 47011	0	N/A	N/A	N/A	N/A
HC Blend A	OZ-12	March 18, 1994 rule, 59 FR 13044	0	3	all components are VOCs	yes (ASHRAE class 3)	1000 (Manufacturer AEL)
HC Blend B	HC-12a	Notice 2, January 13, 1995; 60 FR 3318	0	4	all components are VOCs	yes (ASHRAE class 3)	1000 (Manufacturer AEL)

Name of Substitute	Further Identification Information for Substitute <sup>1</sup>	Previous SNAP Federal Register Listings	ODP	GWP <sup>2</sup>	VOC status	Flammable	Exposure limits <sup>3</sup> (ppm)
HFC-134a	1,1,1,2-tetrafluoroethane; CAS ID # 811-97-2	March 18, 1994 SNAP rule (58 FR 13044); Notice 19, October 1, 2004; 69 FR 58903	0	1,430	exempt	no	1000 (WEEL)
HFC-152a	1,1-difluoroethane; CAS ID # 75-34-3	March 18, 1994 rule, 59 FR 13044; Notice 11, December 6, 1999, 64 FR 68039	0	124	exempt	yes (ASHRAE class 2)	1000 (WEEL)
HFC-227ea	1,1,1,2,3,3,3-heptafluoropropane; CAS ID # 431-89-0	March 18, 1994 SNAP rule (58 FR 13044)	0	3,220	exempt	no	1000 (Manufacturer AEL)
HFC-245fa	1,1,1,3,3-pentafluoropropane; CAS ID # 460-73-1	Notice 13, June 19, 2000, 65 FR 37900; Notice 20, March 29, 2006; 71 FR 15589	0	1,030	exempt	no	300 (WEEL)
HFC-4310mee	1,1,1,2,3,4,4,5,5,5-decafluoropentane; CAS ID # 138495-42-8	Notice 10, June 8, 1999; 64 FR 30410	0	1,640	exempt	no	200 (Manufacturer 8-hr AEL) 400 (Manufacturer ceiling limit AEL)
HFE-7000	1,1,1,2,2,3,3-heptafluoro-3-methoxy-propane; HFE-347mcc3; CAS ID # 375-03-1	Notice 16, March 22, 2002; 76 FR 13272	0	575	exempt	no	75 (Manufacturer AEL)
HFE-7100	Methoxynonafluorobutane, iso and normal; HFE-449s1; CAS ID # 163702-07-6	Notice 10, June 8, 1999; 64 FR 30410; Notice 14, December 18, 2000; 65 FR 78977	0	297	exempt	no	750 (WEEL)
HFE-7200	Ethoxynonafluorobutane, iso and normal; HFE-569st2; CAS # 163702-05-4	Notice 14, December 18, 2000; 65 FR 78977	0	59	exempt	no	200 (Manufacturer AEL)
HFO-1234ze	HFC-1234ze; trans-1,3,3,3-tetrafluoroprop-1-ene; CAS ID # 29118-24-9	Notice 24, September 30, 2009, 74 FR 50129	0	6	VOC <sup>4</sup>	no	1000 (EPA Recommended 8-hr AEL) 10000 (Preliminary EPA Recommended 30-min consumer exposure limit) <sup>5</sup>

Name of Substitute	Further Identification Information for Substitute <sup>1</sup>	Previous SNAP Federal Register Listings	ODP	GWP <sup>2</sup>	VOC status	Flammable	Exposure limits <sup>3</sup> (ppm)
Nitrogen direct gas expansion		March 18, 1994 rule, 59 FR 13044	0	N/A	exempt	no	N/A; ACGIH lists nitrogen as a simple asphyxiant.
Pressure stepdown		March 18, 1994 rule, 59 FR 13044	0	N/A	exempt	N/A	N/A
R-125/134a/600a (28.1%/70.0%/1.9% by weight)	Blend of HFC-125/HFC-134a/isobutane (HFC-125 is 1,1,1,2,2-pentafluoroethane, CAS ID # 354-33-6; R-600a is isobutane, CAS ID # 75-28-5) (NU-22 original composition)	Notice 16, March 22, 2002, 67 FR 13272	0	1,990	one component is VOC	blend not flammable	R-125: 1000 (WEEL) R-134a: 1000 (WEEL) R-600a: 800 (10-hr REL)
R-125/290/134a/600a (55.0%/1.0%/42.5%/1.5% by weight)	Blend of HFC-125/ propane/HFC-134a/isobutane (ICOR AT-22)	Notice 20, March 29, 2006; 71 FR 15589	0	2,530	some components are VOCs	blend not flammable	R-125: 1000 (WEEL) R-290: 1000 (PEL) R-134a: 1000 (WEEL) R-600a: 800 (10-hr REL)
R-290	Propane; CAS ID # 74-98-6	March 18, 1994 rule, 59 FR 13044	0	3	VOC	yes (ASHRAE class 3)	1000 (PEL)
R-404A	R-125/143a/134a (44.0/52.0/4.0) (HFC-143a is 1,1,1-trifluoroethane, CAS ID # 420-46-2)	March 18, 1994 rule, 59 FR 13044; Notice 16, March 22, 2002; 67 FR 13272; Notice 17, December 20, 2002, 67 FR 77927	0	3,920	exempt	blend not flammable	R-125: 1000 (WEEL) R-143a: 1000 (WEEL) R-134a: 1000 (WEEL)
R-407A	R-32/125/134a (20.0/40.0/40.0) (HFC-32 is difluoromethane, CAS ID # 75-10-5)	Notice 1, August 26, 1994; 59 FR 44240; Notice 23, January 2, 2009; 74 FR 21	0	2,110	exempt	blend not flammable	R-134a: 1000 (WEEL) R-32: 1000 (WEEL) R-125: 1000 (WEEL)
R-407B	R-32/125/134a (10.0/70.0/20.0)	Notice 1, August 26, 1994; 59 FR 44240	0	2,800	exempt	blend not flammable	R-134a: 1000 (WEEL) R-32: 1000 (WEEL) R-125: 1000 (WEEL)

Name of Substitute	Further Identification Information for Substitute <sup>1</sup>	Previous SNAP Federal Register Listings	ODP	GWP <sup>2</sup>	VOC status	Flammable	Exposure limits <sup>3</sup> (ppm)
R-407C	R-32/125/134a (23.0/25.0/52.0)	Notice 4, February 8, 1996, 61 FR 4736; Notice 17, December 20, 2002; 67 FR 77927; Notice 18, August 21, 2003; 68 FR 50533; Notice 19, October 1, 2004; 69 FR 58903	0	1,770	exempt	blend not flammable	R-125: 1000 (WEEL) R-32: 1000 (WEEL) R-134a: 1000 (WEEL)
R-407D	R-32/125/134a (15.0/15.0/70.0)	Notice 21; September 28, 2006, 71 FR 56884	0	1,630	exempt	blend not flammable	R-32: 1000 (WEEL) R-125: 1000 (WEEL) R-134a: 1000 (WEEL)
R-410A	R-32/125 (50.0/50.0)	Notice 4, February 8, 1996, 61 FR 4736; Notice 17, December 20, 2002; 67 FR 77927; Notice 19, October 1, 2004; 69 FR 58903	0	2,090	exempt	blend not flammable	R-32: 1000 (WEEL) R-125: 1000 (WEEL)
R-410B	R-32/125 (45.0/55.0)	Notice 4, February 8, 1996, 61 FR 4736	0	2,230	exempt	blend not flammable	R-32: 1000 (WEEL) R-125: 1000 (WEEL)
R-417A	R-125/134a/600a (46.6/50.0/3.4) ISCEON-59/NU-22 (new formulation)	Notice 11, December 6, 1999, 64 FR 68039; Notice 16, March 22, 2002; 67 FR 13272; Notice 17, December 20, 2002; 67 FR 77927; Notice 20, March 29, 2006; 71 FR 15589	0	2,350	one component is VOC	blend not flammable	R-125: 1000 (WEEL) R-134a: 1000 (WEEL) R-600a: 800 (10-hr REL)
R-421A	Choice R421A; R-125/134a (58.0/42.0)	Notice 21; September 28, 2006, 71 FR 56884	0	2,630	exempt	no	R-125: 1000 (WEEL) R-134a: 1000 (WEEL)
R-421B	Choice R421B; R-125/134a (85.0/15.0)	Notice 21; September 28, 2006, 71 FR 56884	0	3,190	exempt	no	R-125: 1000 (WEEL) R-134a: 1000 (WEEL)

Name of Substitute	Further Identification Information for Substitute <sup>1</sup>	Previous SNAP Federal Register Listings	ODP	GWP <sup>2</sup>	VOC status	Flammable	Exposure limits <sup>3</sup> (ppm)
R-422A	ISCEON 79; R-125/134a/600a (85.1/11.5/3.4)	Notice 19, October 1, 2004; 69 FR 58903	0	3,140	one component is VOC	blend not flammable	R-125: 1000 (WEEL) R-134a: 1000 (WEEL) R-600a: 800 (10-hr REL)
R-422B	ICOR XAC1; R-125/134a/600a (55.0/42.0/3.0)	Notice 20, March 29, 2006; 71 FR 15589	0	2,530	one component is VOC	blend not flammable	R-125: 1000 (WEEL) R-134a: 1000 (WEEL) R-600a: 800 (10-hr REL)
R-422C	ICOR XLT1; R-125/134a/600a (82.0/15.0/3.0)	Notice 20, March 29, 2006; 71 FR 15589	0	3,390	one component is VOC	blend not flammable	R-125: 1000 (WEEL) R-134a: 1000 (WEEL) R-600a: 800 (10-hr REL)
R-422D	ISCEON MO29; R-125/134a/600a (65.1/31.5/3.4)	Notice 21; September 28, 2006, 71 FR 56884	0	2,730	one component is VOC	blend not flammable	R-125: 1000 (WEEL) R-134a: 1000 (WEEL) R-600a: 800 (10-hr REL)
R-423A	ISCEON 39TC, Centri-Cool; R-134a/227ea (52.5/47.5)	Notice 16, March 22, 2002; 76 FR 13272	0	2,280	exempt	no	R-134a: 1000 (WEEL) R-227ea: 1000 (Manufacturer AEL)
R-424A	RS-44 (new composition); R-125/134a/600a/600/601a (50.5/47.0/0.9/1.0/0.6)	Notice 21; September 28, 2006, 71 FR 56884; Notice 23; January 2, 2009, 74 FR 21	0	2,440	some components are VOCs	blend not flammable	R-125: 1000 (WEEL) R-134a: 1000 (WEEL) R-600a: 800 (10-hr REL) R-600: 800 (10-hr REL) R-601a: 600 (TLV)
R-426A	RS-24 (new composition); R-125/134a/600/601a (5.1/93.0/1.3/0.6)	Notice 21; September 28, 2006, 71 FR 56884	0	1,510	some components are VOCs	blend not flammable	R-125: 1000 (WEEL) R-134a: 1000 (WEEL) R-600: 800 (10-hr REL) R-601a: 600 (TLV)
R-427A	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	Notice 23; January 2, 2009, 74 FR 21	0	2,140	exempt	no	R-32: 1000 (WEEL) R-125: 1000 (WEEL) R-143a: 1000 (WEEL) R-134a: 1000 (WEEL)

Name of Substitute	Further Identification Information for Substitute <sup>1</sup>	Previous SNAP Federal Register Listings	ODP	GWP <sup>2</sup>	VOC status	Flammable	Exposure limits <sup>3</sup> (ppm)
R-428A	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	Notice 22, October 4, 2007; 72 FR 56628	0	3,610	some components are VOCs	blend not flammable	R-125: 1000 (WEEL) R-143a: 1000 (WEEL) R-290: 1000 (PEL) R-600a: 800 (10-hr REL)
R-434A	RS-45; R-125/143a/134a/600a (63.2/18.0/16.0/2.8)	Notice 22, October 4, 2007; 72 FR 56628	0	3,250	some components are VOCs	blend not flammable	R-125: 1000 (WEEL) R-143a: 1000 (WEEL) R-134a: 1000 (WEEL) R-600a: 800 (10-hr REL)
R-437A	KDD6; MO49 Plus™; R-125/134a/600/601 (19.5/78.5/1.4/0.6)	Notice 23, January 2, 2009, 74 FR 21	0	1,810	some components are VOCs	blend not flammable	Blend: 994 (Manufacturer AEL) R-125: 1000 (WEEL) R-134a: 1000 (WEEL) R-600: 800 (10-hr REL) R-601: 600 (TLV)
R-438A	KDD5, ISCEON MO99; R-32/125/134a/600/ 601a (8.5/45.0/44.2/1.7/ 0.6)	Notice 22, October 4, 2007; 72 FR 56628; Notice 24, September 30, 2009	0	2,270	some components are VOCs	blend not flammable	Blend: 995 (Manufacturer AEL) R-32: 1000 (WEEL) R-125: 1000 (WEEL) R-134a: 1000 (WEEL) R-600: 800 (10-hr REL) R-601a: 600 (TLV)
R-507A	R-125/143a (50.0/50.0)	March 18, 1994 rule, 59 FR 13044; Notice 5, September 5, 1996, 61 FR 47011; Notice 17, December 20, 2002; 67 FR 77927	0	3,990	exempt	blend not flammable	R-125: 1000 (WEEL) R-143a: 1000 (WEEL)
R-600	Butane; CAS ID # 106-97-8	March 18, 1994 rule, 59 FR 13044	0	3	VOC	yes (ASHRAE class 3)	800 (10-hr REL)
R-744	Carbon dioxide, CO <sub>2</sub> ; CAS ID # 124-38-9	March 18, 1994 rule, 59 FR 13044; Notice 2, January 13, 1995; 60 FR 3318	0	1	exempt	no	5000 (PEL or 10-hr REL)

Name of Substitute	Further Identification Information for Substitute <sup>1</sup>	Previous SNAP Federal Register Listings	ODP	GWP <sup>2</sup>	VOC status	Flammable	Exposure limits <sup>3</sup> (ppm)
R-1270	Propylene; 1-propene; CAS ID # 115-07-1	March 18, 1994 rule, 59 FR 13044	0	5	VOC	yes (ASHRAE class 3)	500 (TLV)
RS-24 (2002 formulation)		Notice 17, December 20, 2002; 67 FR 77927	0	1,510	some components are VOCs	blend not flammable	Blend: 1000 (Manufacturer AEL) Components have TLVs, RELs, or WEELs ranging from 600-1000.
RS-44 (2003 formulation)		Notice 18, August 21, 2003, 68 FR 50533	0	2,420	some components are VOCs	blend not flammable	Blend: 1000 (Manufacturer AEL) Components have TLVs, RELs, or WEELs ranging from 600-1000.
Self-chilling can using recycled CO <sub>2</sub>		Notice 8, February 24, 1998; 63 FR 9151	0	1	exempt	no	5000 (PEL or 10-hr REL)
SP34E		Notice 14, December 18, 2000, 65 FR 78977; Notice 15, May 23, 2001; 66 FR 28379	0	1,470 or less	one component is VOC	blend not flammable	1000 (Manufacturer AEL)
Stirling cycle		March 18, 1994 SNAP rule (58 FR 13044)	0	N/A	exempt	N/A	N/A
Volatile Methyl Siloxanes	Octamethylcyclo-tetrasiloxanes (e.g., D4, CAS ID # 556-67-2) and decamethylcyclo-pentasiloxanes (e.g., D5, CAS ID # 541-02-6) for heat transfer	Notice 3, July 28, 1995; 60 FR 38729	0	Low (< 20)	exempt	some compounds are flammable	Depends on compound D4: 10 (Manufacturer AEL) D5: 10 (Manufacturer AEL)
Water		Notice 3, July 28, 1995; 60 FR 38729	0	0	exempt	no	N/A



Name of Substitute	Further Identification Information for Substitute <sup>1</sup>	Previous SNAP Federal Register Listings	ODP	GWP <sup>2</sup>	VOC status	Flammable	Exposure limits <sup>3</sup> (ppm)
Water/lithium bromide absorption	LiBr has CAS ID # 7550-35-8.	March 18, 1994 rule, 59 FR 13044; Notice 5, September 5, 1996, 61 FR 47011	0	0	exempt	no	LiBr: 1 mg/m <sup>3</sup> for 24 hr/day, 90 day exposure (CEGL); 3 mg/m <sup>3</sup> for 8 hr/day, 90 day exposure (CEGL adjusted for 8 hr workday) <sup>6</sup>

<sup>1</sup> Refrigerant blend compositions are identified by the ASHRAE convention of listing component compounds by their refrigerant ("R-") designation, separated by "/", followed by the percentage of each component in the same order, separated by "%".

<sup>2</sup> Hundred year Global Warming Potential, relative to 1 for CO<sub>2</sub>. Blend values are averages, weighting the GWP of individual components by their percentage in the composition and rounding. For some blends with a confidential formulation, the blend value may be presented as a range. For some short-lived compounds that do not have a GWP value in the peer reviewed literature, EPA has provided an estimate with an upper limit, such as "< 20" or "<5."

<sup>3</sup> Eight-hour time-weighted average worker exposure limit expressed in parts per million (ppm), unless otherwise stated.

<sup>4</sup> EPA has received a petition to exempt HFO-1234ze from the definition of VOC for purposes of SIPs to attain and maintain the NAAQS on the basis that the chemical has a low photochemical reactivity. EPA intends to address the request through notice-and-comment rulemaking.

<sup>5</sup> The derivations of EPA's recommended workplace AEL and preliminary consumer exposure limit (acute) are available at [www.regulations.gov](http://www.regulations.gov) as item EPA-HQ-OAR-2003-0118-0250.

<sup>6</sup> EPA's analysis of the National Research Council CEGL and rationale for preliminary workplace exposure limit are available at [www.regulations.gov](http://www.regulations.gov) as item EPA-HQ-OAR-2003-0118-0243.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Confirmation No.: 1039

Ponder et al.

Group Art Unit: 1761

Serial No.: 13/493,491

Examiner: Hardee, John R.

Filed: June 11, 2012

Docket No. 821920-1032

For: **REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22  
REFRIGERANT**

**SECOND DECLARATION OF KENNETH M. PONDER**

I, Kenneth M. Ponder, hereby declare as follows:

1. I am the President of RMS of Georgia, LLC and am a co-inventor named on the above application.

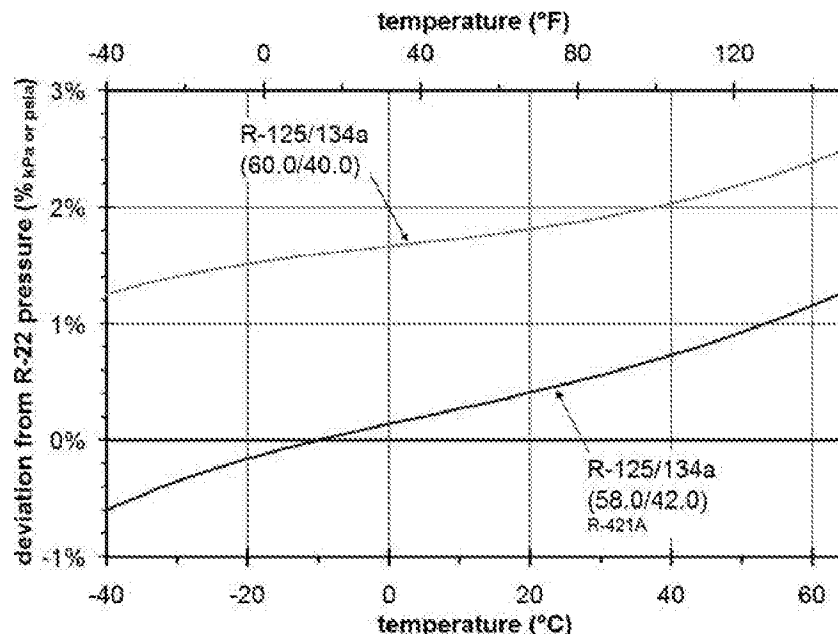
2. RMS of Georgia, LLC sells and distributes refrigerants and reclaims most refrigerants.

3. Among the refrigerants that RMS of Georgia, LLC sells and distributes are refrigerants known under ASHRAE designations R-421A and R-421B. Our R-421A and R-421B refrigerants are approved by ASHRAE and are SNAP approved by the U.S. Environmental Protection Agency (EPA) for use with or as a replacement or substitute for R-22 refrigerant for different uses, as described below. The refrigerant having the ASHRAE designation R-421A is a refrigerant composition of my present application that is a mixture of R-125 (pentafluoroethane) and R-134a (1,1,1,2-tetrafluoroethane) as the only refrigerant gases blended with a lubricant in which R-125 is present in an amount of 58%±1% by weight and R-134a is present in an amount of 42% ±1% by weight of the two refrigerant gases wherein the combined weight of the two gases totals 100%.

4. An accepted guide for refrigerant designations is ASHRAE Standard 34. Based on assignment in prior editions and addenda thereto, Addendum O, Table 2

to ASHRAE Standard 34-2004 identifies my R-421A-series refrigerant blend (along with adopted safety data and classifications for them) as a composition of R-125 and R-134a with formulation and tolerances of: “R-421A: R-125/134a (58.0% / 42.0%) ( $\pm 1.0/\pm 1.0$ ).” As such, a composition of 60% R-125 / 40% 134a (60.0/40.0) is considered by ASHRAE as distinct from R-421A [58% R-125 / 42% 134a (58.0/42.0)] and does not fall within ASHRAE’s formulation tolerances ( $\pm 1.0/\pm 1.0$ ). Stated another way, a 60.0/40.0 (or “60/40”) composition cannot be identified as within ASHRAE’s designation and tolerances for a refrigerant designated or labeled R-421A. Were one to seek a Standard Designation for 60% R-125 / 40% 134a (60.0/40.0), it would be given consideration for a separate ASHRAE designation, in accordance with ASHRAE Standard 34.

5. The following figure shows the difference in deviations from the HCFC refrigerant R-22 (chlorodifluoromethane), the most widely used refrigerant from the late 1950s until 2010 and that most commonly used in residential air conditioners among other applications. Many blends, including R-421A (58% R125 / 42% R134a), were developed for and are marketed as Freon – 22 (R-22) replacements with the phase-out of ozone-depleting substances, of which Freon – 22 (R-22) is one.

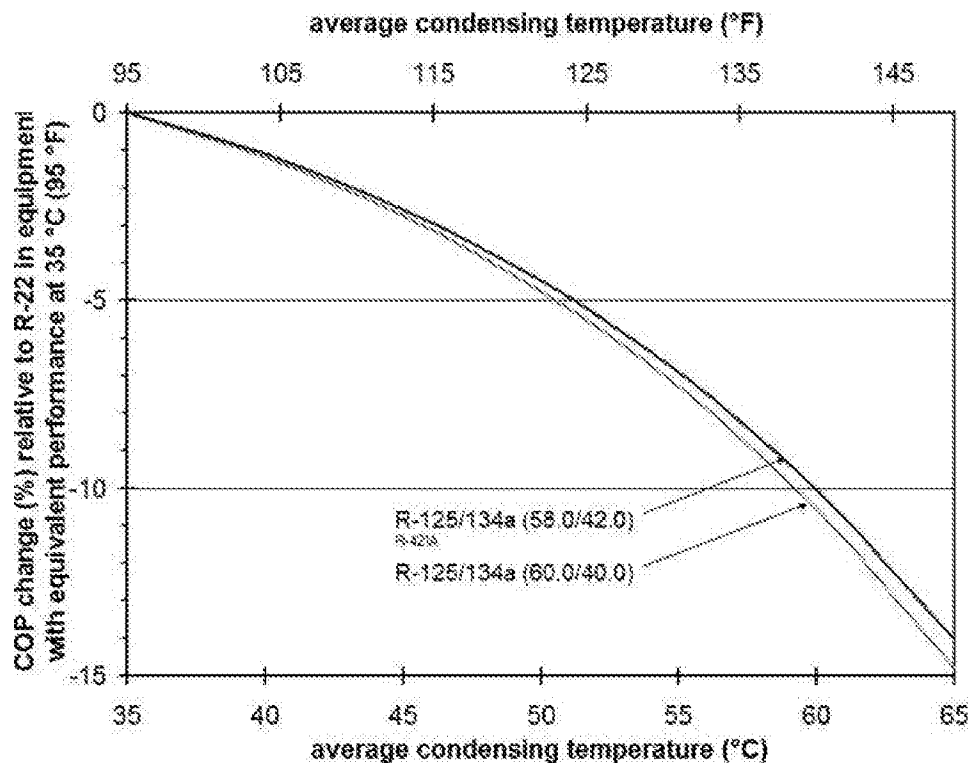


6. As shown in the above figure, R-421A [58% R-125 / 42% R134a (58.0/42.0)] offers a **much closer approximation of the thermodynamic R-22 pressure-temperature (P-T) characteristics** than 60% R-125 / 40% R134a (60.0/40.0), an important consideration for replacement of the HCFC refrigerant Freon – 22 (R22) and for retrofit and specifically for thermostatic expansion valve control of refrigerant flow metering in air conditioning and refrigeration machinery. Over the temperature range of -40 to +65 °C (-40 to +149 °F), the pressure deviation in (kPa or psia) for R-421A [58% R-125 / 42% R134a (58.0/42.0)] compared to Freon -22 (R-22) deviates by -0.6 to +1.3% as contrasted to 1.3 to 2.5% for 60% R-125 / 40% R134a (60.0/40.0) with average deviations of 0.3% and 1.8%, respectively. Restated in terms of gauge pressure (psig), the corresponding ranges are -16.1 to 1.4% for and 33.9 to 2.6% with averages of -0.5 and 4.0%. In short, unexpectedly R-421A [58% R-125 / 42% R134a (58.0/42.0)] better approximates the pressure-temperature (P-T) characteristics of Freon (R-22) than 60% R-125 / 40% R134a (60.0/40.0).

7. For the evaporating temperature span of primary interest as a replacement for the HCFC refrigerant Freon – 22 (R-22) in air conditioning and refrigeration, namely -20 to +10 °C (-4 to +14), the average pressure deviation compared to Freon – 22 (R-22) on an absolute pressure basis for R-421A [58% R-125 / 42% R134a (58.0/42.0)] is approximately 5% that of 60% R-125 / 40% R134a (60.0/40.0).

8. Predicated on a representative average evaporating temperature of 10 °C (50 °F) without superheat, R-421A [58% R-125 / 42% R134a (58.0/42.0)] outperforms 60% R-125 / 40% R134a by 0.15 to 1.04% for average condensing temperatures spanning 35-65 °C (95-149 °F) without sub-cooling. The calculations are based on theoretical-cycle calculations discounting compressor and motor efficiency, fan power and similar parasitic losses and also assuming ideal heat transfer and fluid flow; these

simplifications actually give a very slight advantage to the less-efficient refrigerant option. The following doubly-normalized figure shows the comparative performance losses with increasing condenser temperatures (when cooling is most needed) for such idealized cycles predicated on equipment modification to yield the same nominal coefficient of performance (COP) for Freon – 22 (R-22) and the two substituted blends at the common rating condition of 35 °C (95 °F) condensing:



9. As shown, R-421A [58% R-125 / 42% R134a (58.0/42.0)] unexpectedly outperforms the 60% R-125 / 40% R134a (60.0/40.0)] composition for the full range, but its advantage grows at higher temperatures, namely when air conditioning and refrigeration loads increase (i.e., when most needed). The higher temperatures also are when utility demand rates kick in when applicable (normally for commercial and industrial but not for residential rates). Stated another way, **unexpectedly the “58/42”**

**[R-421A (58% R125 / 42% R134a)] composition benefits are greatest when most needed** as compared to a 60% R125 / 40% R134a composition.

10. The lower fraction of R-125 (with five fluorine atoms per molecule compared to four in the R-134a component) for R-421A [58% R-125 / 42% R134a (58.0/42.0)] implies additional advantages compared to 60% R-125 / 40% R134a (60.0/40.0). First, the lower fluorination implies a slightly lower cost under rational pricing scenarios. Second, the Global Warming Potential (GWP), an indicator of potency as a greenhouse gas relative to carbon dioxide for 100 year integration (the value most often cited and used in treaties and regulations) for R-421A [58% R-125 / 42% R134a (58.0/42.0)] is 2380 compared to 2420 for 60% R-125 / 40% R134a (60.0/40.0); the 1.7% lower (more favorable) value is again due to the lower fraction of R-125 in R-421A [58% R125 / /42% R134a] as compared to 60% R125 / /40% R134a.

11. Attached is a Summary and a Table of Substitute Refrigerants Listed in SNAP Notice 25. The Table provides a listing of refrigerants acceptable as substitute to HCFC-22 (chlorodifluoromethane). This SNAP Notice 25 and the Table are issued by the EPA. The Table includes approximately 45-50 refrigerants determined by the EPA to be acceptable as substitutes for HCFC-22. This Table includes not only my refrigerant designated as R-421A by ASHRAE but also the following refrigerants, among others:

- 1) R125/R290/R134A/R600A in a ratio of 55/1/42.5/1.5% by weight;
- 2) R32/R125/R134A in a ratio of 20/40/40% by weight (known as R407A);
- 3) R125/R134A/R600A in a ratio of 46.6/50.0/3.4% by weight (R417A);
- 4) R125/R134A/R600A in a ratio of 55.0/42.0/3.0 (R422B);
- 5) R125/R134A/R600A/R600/R601A in a ratio of 50.5/47.0/0.9/1.0/0.6% by weight (R424A); and
- 6) R125/R134A in a ratio of 50/50% by weight (R507A).

12. As seen from the SNAP Table, not all combinations of HFC-125 (pentafluoroethane) and HFC-134a (1, 1, 1, 2-tetrafluoroethane) are suitable for use with or as a substitute or a replacement for R-22 (HCFC-22, chlorodifluoromethane). For Example, R416A (134a/125/600 in the ratio 59.0 (+0.5, -1.0)/39.5 (+1.0,-0.5)/1.5 (+1.0,-0.5) is not listed as a suitable replacement for either CFC-11 or HCFC-22. In fact, the only combination of HFC-125 and HFC-134a to the exclusion of other refrigerant gases, such as R290 and R600, that are SNAP approved by the EPA to be suitable for use with or as a substitute or a replacement for the HCFC refrigerant R-22 are our R-421A and R-421B refrigerants.

13. In fact, there are HCFC refrigerants and combinations of R-125 and R-134a that are suitable for use with or as a substitute or a replacement for R-22 (HCFC-22) but not for R-12 (CFC-12) and vice versa. HCFC 125 is an acceptable substitute for CFCs but not HCFC-22. Examples are provided in Table 1 and Table 2 below:

Table 1  
In Air Conditioning

	CFC	HCFC-22
HCFC 123	Yes	No
HCFC 125	Yes	No
HFC 236	Yes	No
R-290	No	Yes
R401A,B	Yes	No
R404A	No	Yes
R-406A	Yes	No
R407A	No	Yes
R409A	Yes	No
R410A,B	No	Yes
R416A	No	No
R417A	No	Yes
R421A	No	Yes
R422B	No	Yes
R424A	No	Yes

Table 2  
In Commercial Refrigeration

	CFC	HCFC-22
HCFC 22	Yes	No
HCFC 152B	No	Yes
HFC 236	Yes	No
R290	No	Yes



R401A,B	Yes	No
R402A,B	Yes	No
R406A	Yes	No
R408A	Yes	No
R409	Yes	No
R410A,B	No	Yes
R411A,B	Yes	No
R416A	No	No
R417A	No	Yes
R421A	No	Yes
R422B	No	Yes
R424A	No	Yes

14. Attached hereto is a Table 7 including a listing of the refrigerants that are primarily offered in competition to my R-421A refrigerant along with their respective dew points and bubble points. The bubble point and dew point for HCFC-22 are -41.46 and -41.46°F, respectively. While the bubble point for my R-421A refrigerant closely approximates that of HCFC-22, the blend dew point does not; yet as shown above my R-421A refrigerant performs surprisingly well as a substitute for HCFC-22. In fact, I have found that to adjust the ratio of R125 and R134a in my refrigerant blend away from its 58% (±1.0 %) R125 and 42% (±1.0) so the its dew point of about -32°F (in particular, -31.65°F) more closely matches the dew point of HCFC-22 would negatively impact the aforementioned Global Warming Potential (GWP) of my refrigerant.

15. I have read US Patent No. 6,207,071 that I understand is cited against my above application. I do not find any teaching therein on how to select or design a refrigerant composition to serve as a substitute specifically for HCFC-22. There is a general statement in column 1, lines 21-27, to the use of "CFC (chlorofluorocarbon) and HCFC (hydrochlorofluorocarbon)" is now restricted. This statement, however, does not specifically identify HCFC-22 (chlorodifluoromethane). Moreover, there is no mention, let alone any suggestion, in Takigawa of considering the bubble point and/or dew point of a refrigerant blend of refrigerants in designing a blend of refrigerant gases to serve as a substitute for HCFC-22.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of this patent.

Respectfully submitted,

Date: September 28 2017

  
Kenneth M. Ponder

# ATTACHMENT OF TABLE 7

Comparative Properties and Efficiency of R-421A for Retrofit Use to Replace R-22  
James M. Cahn, Engineering Consultant, USA

JSSC/RMS-1312a  
2013.12.26

Table 7: Data for Selected Refrigerants (IP units)

properties	R-22	R-407C	R-410A	R-421A	R-422B	R-422D	R-427A	R-438A
molar mass (lb/mol)	0.109628	0.100046	0.160023	0.346359	0.238242	0.242365	0.198385	0.218478
normal boiling point (NBP)								
bubble point for blends (°F)	-41.48	-48.53	-60.00	-41.22	-42.36	-45.78	-45.33	-44.18
blend dew point (°F)	-41.48	-33.93	-60.46	-31.85	-32.59	-37.01	-35.16	-33.65
maximum temperature glide								
at NBP (°F)	0.000	12.597	0.142	9.568	0.769	8.747	12.164	11.540
at 88 °F (°F)	0.000	18.005	0.208	6.582	6.234	6.373	9.323	8.608
density at NBP								
saturated liquid (lb/ft <sup>3</sup> )	87.37	88.19	84.28	91.18	87.26	87.81	85.48	86.84
saturated vapor (lb/ft <sup>3</sup> )	6.2936	6.2891	6.2506	6.3731	6.3832	6.3718	6.3030	6.3319
latent heat of vaporization								
at NBP (Btu/lb)	100.8	107.2	117.4	82.5	84.2	81.8	101.8	92.8
at NBP (Btu/lb) vapor	28.53	35.88	30.00	30.78	30.86	30.49	30.83	30.83
at 140 °C (Btu/lb)	60.23	58.29	45.23	41.48	41.78	37.84	53.00	47.28
saturated vapor pressure								
at 88 °F (psia)	132.8	127.7	208.3	118.8	128.7	131.1	184.2	122.8
at 140 °F (psia)	352.1	368.8	556.1	338.3	345.3	364.3	355.0	349.7
critical point								
temperature (°F)	209.1	168.0	160.4	181.0	181.0	179.2	188.0	188.3
pressure (psia)	723.7	871.4	710.8	588.4	574.8	589.3	637.0	624.3
specific volume (ft <sup>3</sup> /lb)	0.0908	0.0331	0.5548	0.0281	0.0304	0.0303	0.0327	0.0314
ozone depletion potential (ODP) relative to R-11								
scientific	0.04	0	0	0	0	0	0	0
regulatory (MP)	0.055							
global warming potential (GWP) for 100 yr ITH								
scientific relative to CO <sub>2</sub>	1750	1703	2103	2603	2563	2703	2100	2200
ASHRAE 34 / ISO 817 safety classification	A1	A1	A1	A1	A1	A1	A1	A1
ASHRAE 34 Refrigerant Concentration Limit (RCL) (lb/Mcf)	19	18	28	17	18	18	16	4.9

The gray regions of Table 6 and Table 7 indicate inapplicable data, namely the absence of composition-based glide based for the single-compound R-22. They also signify inapplicable data for blends not directly regulated by ozone depletion potential (ODP) in international treaties (notably the Montreal Protocol) and most regulations, though regulatory consequences result indirectly based on mass-weighted formulations of the blends.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	31307061
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau.
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	21-DEC-2017
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	15:06:45
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response After Final Action	8219201032_Response_to_Final_Office_Action_AFCP.pdf	207591 7d09a35346a046c38d5faedce73097b05c283cac	no	21

**Warnings:** Case 5:20-cv-00142-FL Document 153-8 Filed 06/04/21 Page 137 of 383 136

<b>Information:</b>					
2	After Final Consideration Program Request	8219201032_AFCP_form.pdf	227019	no	2
			6b82284e94e8908d6273cf5a010f3bb3f6d4513b		
<b>Warnings:</b>					
<b>Information:</b>					
3	Miscellaneous Incoming Letter	8219201032_Summary_of_Substitute_Refrigerants_Listed_in_SNAP.pdf	377992	no	10
			aa442e3e9179f790e89713931f2017543681aa44		
<b>Warnings:</b>					
<b>Information:</b>					
4	Miscellaneous Incoming Letter	8219201032_Second_Declaration_of_Kenneth_M_Ponder.pdf	1001872	no	11
			6674040938b8eec5c434e27dc2f179c8e5f422f7		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			1814474		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875	Application or Docket Number <b>13/493,491</b>	Filing Date <b>06/11/2012</b>	<input type="checkbox"/> To be Mailed
---	---	----------------------------------	---------------------------------------

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

**APPLICATION AS AMENDED – PART II**

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	12/21/2017	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X \$40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X \$210 =	0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	X \$ =	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
					TOTAL ADD'L FEE	

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SLIE  
GOIGA DUCKETT

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039
24504	7590	12/05/2017	EXAMINER	
THOMAS   HORSTEMEYER, LLP			HARDEE, JOHN R	
3200 WINDY HILL ROAD, SE			ART UNIT	
SUITE 1600E			PAPER NUMBER	
ATLANTA, GA 30339			1761	
			NOTIFICATION DATE	
			DELIVERY MODE	
			12/05/2017	
			ELECTRONIC	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@tkhr.com  
ozzie.liggins@tkhr.com  
docketing@thomashorstemeyer.com



<b><i>Applicant-Initiated Interview Summary</i></b>	<b>Application No.</b> 13/493,491	<b>Applicant(s)</b> Ponder et al.	
	<b>Examiner</b> JOHN R HARDEE	<b>Art Unit</b> 1761	<b>AIA Status</b> No

All participants (applicant, applicants representative, PTO personnel):

(1) JOHN R. HARDEE. (3) \_\_\_\_.

(2) Mr. Todd Deveau. (4) \_\_\_\_.

Date of Interview: 30 November 2017.

Type: ☒ Telephonic ☐ Video Conference  
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.

If Yes, brief description: \_\_\_\_.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☒Others

(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: \_\_\_\_.

Identification of prior art discussed: \_\_\_\_.

#### Substance of Interview

(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Mr. Deveau submitted an automated interview request. Noting that the application was after final, the examiner called Mr. Deveau to discuss the need for an interview. A declaration containing additional data which was prepared by the applicant is not present in the electronic file wrapper. The declaration may have been lost by the Office, or applicant may have forgotten to submit it with the response to the rejection of March 28, 2017. Upon consultation with his supervisor, the examiner called back to say that filing an RCE would be appropriate prior to filing the declaration..

**Applicant recordation instructions:** The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

**Examiner recordation instructions:** Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/JOHN R HARDEE/  
Primary Examiner, Art Unit 1761

## Summary of Record of Interview Requirements

### Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

#### Title 37 Code of Federal Regulations (CFR) 1.133 Interviews Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

#### 37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiners responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicants correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,-
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,  
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicants record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

#### Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiners version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, Interview Record OK on the paper recording the substance of the interview along with the date and the examiners initials.



UNITED STATES PATENT AND TRADEMARK OFFICE

# USPTO Automated Interview Request (AIR)

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Nov 30 2017

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This paper requesting to schedule and/or conduct an interview is appropriate because:

This submission is requested to be accepted as an authorization for this interview to communicate via the internet. Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned concerning scheduling of the interview via video conference, instant messaging, or electronic mail, and to conduct the interview in accordance with office practice including video conferencing.

Name(s) :

Todd Deveau

S-signature:

/Todd Deveau/

Registration Number:

29526

U.S. Application Number:

13493491

Confirmation Number:

1039

E-mail Address:

todd.deveau@thomashorstemeyer.com

Phone Number:

7700339500

Proposed Time of Interview:

12-8-2017 10:30 AM ET

Preferred Interview Type:

Telephonic

I am the applicant or applicant's representative for this application.



UNITED STATES  
PATENT AND TRADEMARK OFFICE

PALM-SILVER



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039
24504	7590	10/12/2017	EXAMINER	
THOMAS I HORSTEMEYER, LLP			HARDEE, JOHN R	
3200 WINDY HILL ROAD, SE			ART UNIT	
SUITE 1600E			PAPER NUMBER	
ATLANTA, GA 30339			1761	
			NOTIFICATION DATE	
			DELIVERY MODE	
			10/12/2017	
			ELECTRONIC	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@tkhr.com  
ozzie.liggins@tkhr.com  
docketing@thomashorstemeyer.com

<b>Office Action Summary</b>	<b>Application No.</b> 13/493,491	<b>Applicant(s)</b> PONDER ET AL.	
	<b>Examiner</b> JOHN HARDEE	<b>Art Unit</b> 1761	<b>AIA (First Inventor to File) Status</b> No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 9/28/17.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims\*

- 5) ☒ Claim(s) 30-49 is/are pending in the application.  
5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 30-49 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

\* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

#### Certified copies:

- a) ☐ All b) ☐ Some\*\* c) ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)  
Paper No(s)/Mail Date \_\_\_\_.
- 3) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Other: \_\_\_\_.

1. The present application is being examined under the pre-AIA first to invent provisions.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 30-49 remain rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Takigawa et al., US 6,207,071, for the reasons of record in the previous office action.

### ***Response to Arguments***

4. Applicant's arguments filed September 28, 2017 have been fully considered but they are not persuasive. Applicant's arguments largely repeat those answered in the previous office action and remain non-persuasive for the reasons of record. Applicant argues that the Takigawa reference does not provide any teaching or suggestion on how to select a refrigerant composition to serve as a substitute specifically for R-22. This is not persuasive because the rejection was made for obviousness, not anticipation. Again, the examiner has not argued that all 40:60 to 60:40 mixtures of R-125 and R-134a will behave identically. The reference provides this relatively narrow window in which to experiment. Reproduction of the content of the declarations of Kenneth Ponder is appreciated. This information has been considered and commented upon previously. Applicant's citation of case law is well taken. Perhaps the issue is ripe

for appeal and for additional guidance to be provided to both the examiner and the attorney by the PTAB.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, Dr. John R. Hardee, whose telephone number is (571) 272-1318. The examiner can normally be reached on Monday through Friday from 8:00 until 4:30. In the event that the examiner is not available, his supervisor, Mr. Harold Pyon, may be reached at (571) 272-1498.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8100. Please note that examiners may not accept or enter faxed amendments.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

Art Unit: 1761

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/John R. Hardee/  
Primary Examiner  
October 5, 2017



## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	13493491			
<b>Filing Date:</b>	11-Jun-2012			
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder			
<b>Filer:</b>	Todd Deveau.			
<b>Attorney Docket Number:</b>	821920-1032			
Filed as Small Entity				
<b>Filing Fees for    Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	700	700
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>700</b>

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	30511587
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau.
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	28-SEP-2017
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	18:07:06
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

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Payment was successfully received in RAM	\$ 700
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Fee Worksheet (SB06)	fee-info.pdf	30759	no	2
			5c0f0222e5ae943f2ccadd8b230b887365225dfd		

**Warnings:****Information:**

<b>Total Files Size (in bytes):</b>	30759
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application of:	Confirmation No.: 1039
Ponder et al.	Group Art Unit: 1761
Serial No.: 13/493,491	Examiner: Hardee, John R.
Filed: June 11, 2012	Docket No. 821920-1032
For: <b>REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT</b>	

**RESPONSE TO NON-FINAL OFFICE ACTION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

The Non-final Office Action from Examiner John R. Hardee mailed on March 28, 2017 (Paper No./Mail Date 20170321), has been received and reviewed. Applicants provide the following amendments and remarks in response.

**AUTHORIZATION TO DEBIT ACCOUNT**

A petition for a 3-month extension of time is herein submitted. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including, but not limited to, fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 20-0778.

**IN THE CLAIMS:**

Please amend the claims as indicated hereafter wherein the changes are shown by strikethrough or double brackets for deleted matter and underlining for added matter.

1 – 29. (Cancelled)

30. (Previously presented) In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethanes wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

31. (Previously Presented) In the apparatus of claim 30, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

32. (Previously Presented) A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute refrigerant composition designed to achieve a phase change and comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%,

(2) supplying the substitute refrigerant composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

(3) adding to said apparatus via the manifold the substitute refrigerant composition for chlorodifluoromethane, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

33. (Previously Presented) The method of claim 32, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

34. (Previously Presented) A refrigerant composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure,

wherein in the substitute refrigerant said pentafluoroethane is present in an amount of 59% to 57% by weight and said tetrafluoroethane is present in an amount of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

35. (Previously Presented) The refrigerant composition of claim 34, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

36. (Previously Presented) The refrigerant composition according to claim 34, wherein the lubricating oil includes an additive selected from the group consisting of further includes an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.



37. (Previously Presented) In the apparatus of claim 30, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

38. (Previously Presented) In the apparatus of claim 30, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

39. (Previously Presented) The method according to claim 32, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

40. (Previously Presented) The method according to claim 32, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

41. (Previously Presented) In the apparatus of claim 30, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.

42. (Previously Presented) The method of claim 32, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.

43. (Previously Presented) The refrigerant composition of claim 34, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.

44. (Previously Presented) In the apparatus of claim 41, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

45. (Previously Presented) The method according to claim 42, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

46. (Previously Presented) The refrigerant composition according to claim 43, wherein said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

47. (Previously Presented) In the apparatus of claim 30, wherein the blend exhibits a glide at about 9.5°F.

48. (Previously Presented) The method of claim 32, wherein the blend exhibits a glide at about 9.5°F.

49. (Previously Presented) The refrigerant composition of claim 34, wherein the blend exhibits a glide at about 9.5°F.

**REMARKS**

The Office Action presents following single point, namely: claims 30-49 stand rejected under 35 USC 103(a) as obvious in view of US 6,207,071 (Takigawa et al.).

Claims 30-49 are pending.

First, Applicants' thank the Examiner for the issuance of a new Non-final Office Action, in view of Applicants' arguments regarding chlorofluorocarbon substitutes versus hydrochlorofluorocarbons substitutes in their previous response.

Applicants respectfully request reconsideration and withdrawal of the rejection based upon the amendments and remarks presented herein.

The presently pending claims are directed to a refrigerant consisting of a blend of tetrafluoroethane and pentafluoroethane to be a substitute for chlorodifluoromethane (HCFC-22). For example, claim 30 recites "the improvement comprising substituting the chlorodifluoromethane (HCFC-22) with a refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at 1 standard atmosphere pressure, wherein in the substitute refrigerant pentafluoroethane is present in an amount of 59% to 57% by weight and tetrafluoroethane is present in an amount of 41 % to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and tetrafluoroethane totaling 100%.

Takigawa does not provide any teaching or suggestion on how to select or design a refrigerant composition to serve as a substitute specifically for HCFC-22. Instead it provides only a general statement, for example in column 1, lines 21-27, that the use of "CFC (chlorofluorocarbon) and HCFC (hydrochlorofluorocarbon)" is now restricted. This statement, however, does not specifically identify or reference HCFC-22 (chlorodifluoromethane).

Moreover, there is no mention, let alone any suggestion, in Takigawa of considering the bubble point and/or dew point of a blend of refrigerants in designing a blend of refrigerant gases to serve as a substitute for HCFC-22.

More specifically, neither is there any reference to identifying refrigerants that can serve as a replacement for HCFC-22 or focusing on the bubble point and/or the dew point of a blend of refrigerants in order to define a refrigerant composition acceptable as a substitute for HCFC-22. Neither or these points are addressed or even mentioned anywhere in Takigawa. Nor does the Office Action provide any citation to where in Takigawa there is any teaching or suggestion of how to go about selecting or configuring a blend of refrigerants to serve as a substitute for HCFC-22, let alone focusing on the bubble point and/or dew point of the substitute refrigerant blend in order to configure a substitute refrigerant for HCFC-22.

Some HCFC refrigerants have been found to be acceptable as a substitute for HCFC - 22 and some have not. Interestingly, HCFC-125 (R125; pentafluoroethane) alone is not an acceptable substitute for HCFC-22. Moreover, nothing in Takigawa teaches or suggests that HCFC-125 could be used as a substitute for HCFC-22 either alone or in combination with one or more refrigerants, or further that even combining R134a with HCFC-125 would result in a refrigerant blend that is an acceptable substitute for HCFC-22. In fact, as previously shown, R416a which is a blend of R134a, R125, and R600 in the ratio of 59.0 (+0.5, -1.0)/39.5(+1.0, - 0.5)/1.5(+1.0, - 0.5), which, thus, includes both R125 and R134a in approximately 60% R134a and 40% R125 is not an acceptable substitute for HCFC-22, or even CFC11 (R11). See, Second Declaration of Kenneth Ponder, paragraph 12.

In the end, considering that Takigawa provides no teaching or suggestion as to replacements specifically for HCFC-22 or any focus on bubble point and/or dew point of a refrigerant blend for determining a suitable replacement or substitute refrigerant for HCFC-22, to say that Takigawa renders obvious the refrigerant blend of the present claims requires reliance on impermissible hindsight.

Applicants thank the Examiner for the comments provided under the Response to Arguments at pages 3-4, in particular, paragraph 3, therein. Applicants note the comment therein that "the reference [Takigawa] does provide motivation to experiment within a relatively narrow range defined suitable hydrochlorofluorocarbons substitutes." First, this comment does not identify that the reference provides any motivation to find a suitable substitute for HCFC-22, but only references hydrochlorofluorocarbons generally which covers a wide range of disparate hydrochlorofluorocarbons.

Second, this comment makes reference to "motivation to experiment within a relatively narrow range". The "relatively narrow range" is not identified or explained in the response to arguments. Applicants understand, however, that Takigawa is relied upon as teaching a range of (40 to 60% R-134a) and a range of 60 to 40% R125, relying for example, on column 8, lines 20-28. Applicants, therefore, have to question what is meant in the Office Action by "a relatively narrow range" when as previously shown a range of 40 to 60% of one refrigerant gas and a range of 60 to 40% of another refrigerant gas is not considered a "relatively narrow range" by the standards organization ASHRAE who define refrigerant compositions by a range of only  $\pm 0.5\%$  or a range of  $\pm 1.0\%$ . Applicants note that, though this point was previously raised, the Office Action does not respond to this point. Additionally, the ASHRAE standards previously discussed and provided show that this 20% variation is an unacceptably large range in the context of refrigerants and refrigerant gases. Moreover, as previously shown, this range can be considered as including a refrigerant such as R416a that is not acceptable as a substitute for HCFC-22.

If the Examiner's logic is to be accepted, one would then expect all refrigerants within the range of 40 to 60% and 60 to 40 % would result in an acceptable refrigerant blend that could be used as a substitute for HCFC-22 when it has been shown that this is not the case. The additional statement that: "The Examiner has not argued, nor does he believe that all

compositions falling within this narrow range will behave identically” is inconsistent with the previous statement.

The following statement in the Office Action that: “This is the purpose of experimentation” appears to be based on a blind “obvious to try” standard being applied in the Office Action. This sentence begs the question – “What is the purpose?” The Office Action does not clearly identify or explain what the purpose of the alluded experimentation is or what is to be accomplished by it. For the supposed experimentation to have a “purpose” there must be an objective in mind. The only “purpose” attributed to the experimentation appears to be to find out if all compositions within the range of 20% would behave identically – not to find an acceptable substitute for HCFC-22.

In the present application the objective in mind is to find not just any substitute for any HCFC, but one specifically for HCFC-22. Without the teaching or suggestion of Takigawa to look for a substitute for HCFC-22, in particular, or what criteria or characteristics one might focus on in order to guide such “purpose” for experimentation, any motivation taken from Takigawa can only be considered a “blind” “obvious to try”. Otherwise, again, the purpose is based upon impermissible hindsight based upon the teachings of the present application.

In addition, the Office Action has not stated what result-effective parameters are to be considered or involved in carrying out the “obvious to try” experimentation over a variation of 20% other than to find out if all compositions over the range of 20% would behave identically. This, however, would not lead one to determine an acceptable substitute for HCFC-22. Instead, such experimentation would only determine whether one composition within the 20% range behaves identically to another composition within the 20% range.

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as “a routine experimentation”. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Only result-effective variables can be

optimized. The Office has failed to describe what features are result-effective variables in finding an acceptable substitute for HCFC-22 as they are used in the claimed subject matter. Specifically, the Office has failed to state what the recognized result that is to be achieved. In addition, the Office does not provide any support for the assertion that these features are routinely optimized as is used in the claims. Rather the Office makes a conclusory assertion that the amounts can be optimized without a reasonable argument to support its position. Thus, the Office has not met its prima facie case of obviousness. Accordingly, the claims are novel and non-obvious over Takigawa.

Section 3 goes on to comment that the "reference [Takigawa] implicitly discloses a refrigerant composition consisting of 40% tetrafluoroethane and 60% pentafluoroethane which is considered the closest prior art." The Office Action goes on to suggest that: "if Applicant believes that compositions according to current claims provide unexpected benefits over this composition, such should be demonstrated being timely filed declaration. Attorney arguments cannot take the place of evidence."

In response, Applicants submit herewith, that the Second Declaration of Kenneth Ponder showing just this. As demonstrated in the Second Declaration of Kenneth Ponder and as previously argued and presented, the composition of the present claims is designated by ASHRAE as R421a consisting of 58% (+1.0 – 1.0%) and 42% R134a (+1.0, -1.0%). Furthermore, ASHRAE's designation providing formulation tolerances of +/-1% for each of the 2 components shows that the composition referenced in the Office Action of 60% pentafluoroethane and 40% tetrafluoroethane does not fall within ASHRAE's designation nor within ASHRAE's formulation tolerances for the present R421a showing that ASHRAE considers a composition of 60% R125 and 40% R134a to be distinct from the present R421a.

Furthermore, the present R421a composition offers a much closer approximation of the thermodynamic HCFC-22 (R22) pressure-temperature characteristics than the 60%/40% composition asserted to be taught by Takigawa and that such is an important consideration for

replacement of HCFC-22 in for retrofit and specifically for thermostatic valve control of refrigerant flow metering and air conditioning and refrigeration machinery. In short, unexpectedly, R421a better approximates the pressure-temperature characteristics of HCFC-22 than a composition of 60% R-125 and 40% R134a. Furthermore, the R124a out performs a blend of 60% R125a and 40% R134a for average condensing temperatures. Additionally, the advantage of R421a over a 60/40% composition grows at higher temperatures, namely, when air conditioning and refrigeration modes increased, i.e., when they are most needed. Stated another way, **unexpectedly the “58/42” [R-421A (58% R125 / 42% R134a)] composition benefits are greatest when most needed** as compared to a 60% R125 / 40% R134a composition. See, Second Declaration of Kenneth Ponder, paragraphs 5-9.

These arguments were presented in the previous Response to Final Office Action filed February 28, 2017 and are now supported by evidence by way of the Second Declaration of Kenneth Ponder. Additionally, just to be clear, these arguments are repeated, in part, below.

Previously submitted with the Supplemental IDS herewith are copies of the EPA's listing of Substitute Refrigerants Under SNAP as of October 4, 2011 that provides a list of acceptable substitutes for Class I (CFCs) under the SNAP program as of October 4, 2011 and the EPA's Summary of Substitute Refrigerants Listed in SNAP Notice 25 providing a listing of refrigerant substitutes for HCFC-22 (chlorodifluoromethane). Comparing the two lists one finds the following comparison of many refrigerants that are listed as a suitable replacement for one but not the other. Examples are provided in Tables 1 and 2 below.



Table 1  
In Air Conditioning

	CFC	HCFC-22
HCFC 123	Yes	No
HCFC 125	Yes	No
HFC 236	Yes	No
R-290	No	Yes
R401A,B	Yes	No
R404A	No	Yes
R-406A	Yes	No
R407A	No	Yes
R409A	Yes	No
R410A,B	No	Yes
R416A	No	No
R417A	No	Yes
R421A	No	Yes
R422B	No	Yes
R424A	No	Yes

Table 2  
In Commercial Refrigeration

	CFC	HCFC-22
HCFC 22	Yes	No
HCFC 152B	No	Yes
HFC 236	Yes	No
R290	No	Yes
R401A,B	Yes	No
R402A,B	Yes	No
R406A	Yes	No
R408A	Yes	No
R409	Yes	No
R410A,B	No	Yes
R411A,B	Yes	No
R416A	No	No
R417A	No	Yes
R421A	No	Yes
R422B	No	Yes
R424A	No	Yes

Thus, just because a refrigerant may be suitable or acceptable as a replacement for some CFC refrigerant, that either Takigawa nor the Examiner identifies, does not automatically render it suitable for replacement of an HCFC refrigerant, and vice versa. In fact R416A (134a/125/600 in the ratio 59.0 (+0.5, -1.0)/39.5 (+1.0,-0.5)/1.5 (+1.0,-0.5) is not listed as a suitable replacement for either CFC-11 or HCFC-22. Further, there is simply no teaching or suggestion for such in Takigawa. This demonstrates the unpredictability in the art.

Attached hereto is a Table 7 including a listing of the refrigerants that are primarily offered in competition to my R-421A refrigerant along with their respective dew points and bubble points. The bubble point and dew point for HCFC-22 are  $-41.46$  and  $-41.46^{\circ}\text{F}$ , respectively. While the bubble point for my R-421A refrigerant closely approximates that of HCFC-22, the blend dew point does not; yet as shown above my R-421A refrigerant performs surprisingly well as a substitute for HCFC-22. In fact, the inventors found that to adjust the ratio of R125 and R134a in my refrigerant blend away from its  $58\% \pm 1.0\%$  R125 and  $42\% \pm 1.0\%$  R134a so the dew point more closely matches the dew point of HCFC-22 would negatively impact the aforementioned Global Warming Potential (GWP). See, Second Declaration of Kenneth Ponder, paragraph 14.

Moreover referring again to the "Summary of Substitute Refrigerants Listed in SNAP Notice 25," Applicants previously noted to the Office that their present invention has received SNAP approval as a replacement for HCFC-22, but not CFC-11. The Summary includes a Table of SNAP approved refrigerant substitutes for HCFC-22 (chlorodifluoromethane) that lists approximately 45 to 50 differing refrigerant blends that are all approved substitutes for HCFC-22, including Applicants' present invention. This SNAP listing refutes the Examiner's reliance on the present invention being a "mere" optimization of the teachings of Takigawa, or stated in another way that it is simply "obvious to try" the teachings of Takigawa to arrive at the present invention. In view of the number of refrigerants listed as acceptable substitutes it appears the odds would be extremely low that one would arrive at Applicants' refrigerant based on Takigawa. See, Second Declaration of Kenneth Ponder, paragraph 11.

Included in this SNAP listing are numerous blends of refrigerants that comprise pentafluoroethane (R-125) and tetrafluoroethane (R-134A). Further, many of such refrigerants include pentafluoroethane in a range between 60 to 40% and tetrafluoroethane in a range of 40 to 60% such as: 1) R125/R290/R134A/R600A in a ratio of 55.01/1/42.5/1.5% by weight; 2) R32/R125/R134A in a ratio of 20/40/40% by weight (known as R407A); 3) R125/R134A/R600A in

a ratio of 46.6/50.0/3.4% by weight (R417A); 4) R125/R134A/R600A in a ratio of 55.0/42.0/3.0 (R422B); 5) R125/R134A/R600A/R600/R601A in a ratio of 50.5/47.0/0.9/1.0/0.6% by weight (R424A); and 6) R125/R134A in a ratio of 50/50% by weight (R507A). As seen by the ASHRAE "R" designations, each of these refrigerant blends or compositions is considered by ASHRAE to be a different refrigerant offering properties different from those of the other ASHRAE designated refrigerants. See, Second Declaration of Kenneth Ponder, paragraph 12.

In Honeywell International Inc. v. Mexichem Amanco Holding S.A.D.E.C.V. et al., Appeal No. 2016-1996, August 1, 2017) the Federal Circuit Court of Appeals reviewed and rejected arguments presented by the U.S. Patent and Trademark Office, Patent Trial and Appeal Board, in which the Board found on reexamination claims to a refrigerant namely, 1,1,1,2-tetrafluoropropene (HFO-1234YF) unpatentable on grounds that are basically the same as those presented in the present Office Action. In Honeywell, the Federal Circuit found that the Board committed legal error by improperly relying on inherency to find obviousness of the claims. Additionally, the Federal Circuit found error by the Board, while noting the overall unpredictability in the refrigerant art, the Board asserted that "routine testing" would have led to the discovery of the claimed refrigerant. The Federal Circuit rejected the Board's assertion concerning "routine testing" and reversed the rejection of the claims. The Board noted:

"A further point regarding so-called 'routine testing' is that § 103 provides that "[p]atentability shall not be negated by the manner in which the invention was made." 35 U.S.C. § 103 (2012). That provision was enacted to ensure that routine experimentation does not necessarily preclude patentability. See, e.g., *In re Saether*, 492 F.2d 849, 854 (C.C.P.A. 1974) ("In his argument that 'mere routine experimentation' was involved in determining the optimized set of characteristics, the solicitor overlooks the last sentence of 35 U.S.C. § 103...Here we are concerned with the question of whether the claimed invention would have been obvious at the time it was made to a person having ordinary skill in the art-not how it was achieved." (internal citation omitted)); *In re Fay*, 347 F.2d 597, 602 (C.C.P.A. 1965) ("[W]e do not agree that 'routine experimentation' negatives patentability. The last sentence of section 103 states that 'patentability shall not be negated by the manner in which the invention was made.'").

Thus, as shown herein, the Examiner's reliance on the statement: "The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified" in Takigawa is not correct. As shown, Applicants' recited composition does not have properties similar to those compositions which according to the Examiner would also be exemplified in *Takigawa et al.*

### **CONCLUSION**

In light of the foregoing remarks and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed and that all pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

**THOMAS | HORSTEMEYER, LLP**

By: /Todd Deveau/

**Todd Deveau**

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# **ATTACHMENT OF TABLE 7**

**Table 7: Data for Selected Refrigerants (IP units)**

properties	R-22	R-407C	R-410A	R-421A	R-422B	R-422D	R-427A	R-438A
molar mass (lb/mol)	0.190629	0.190046	0.160023	0.246359	0.239242	0.242365	0.199395	0.218478
normal boiling point (NBP)								
bubble point for blends (°F)	-41.46	-46.53	-60.60	-41.22	-42.36	-45.76	-45.33	-44.19
blend dew point (°F)	-41.46	-33.93	-60.46	-31.65	-32.59	-37.01	-33.16	-33.05
maximum temperature glide								
at NBP (°F)	0.000	12.597	0.142	9.569	9.769	8.747	12.164	11.140
at 68 °F (°F)	0.000	10.065	0.209	6.582	6.234	5.373	9.323	8.605
density at NBP								
saturated liquid (lb/ft <sup>3</sup> )	87.97	86.19	84.26	91.19	87.25	87.51	85.46	86.84
saturated vapor (lb/ft <sup>3</sup> )	0.2936	0.2891	0.2606	0.3731	0.3632	0.3718	0.3030	0.3319
latent heat of vaporization								
at NBP (Btu/lb)	100.6	107.2	117.4	82.5	84.2	81.8	101.8	92.8
at NBP (Btu/ft <sup>3</sup> ) vapor	29.53	30.98	30.60	30.78	30.58	30.40	30.83	30.80
at 140 °C (Btu/lb)	60.20	56.29	45.23	41.48	41.78	37.94	53.00	47.28
saturated vapor pressure								
at 68 °F (psia)	132.0	127.7	209.3	119.0	120.7	131.1	124.2	122.8
at 140 °F (psia)	352.1	366.8	556.1	338.3	340.3	364.3	355.0	349.7
critical point								
temperature (°F)	205.1	186.9	160.4	181.0	181.8	175.2	185.6	185.5
pressure (psia)	723.7	671.4	710.9	568.4	574.0	566.3	637.0	624.3
specific volume (ft <sup>3</sup> /lb)	0.0306	0.0331	0.0349	0.0291	0.0304	0.0303	0.0327	0.0314
ozone depletion potential (ODP) relative to R-11								
scientific	0.04	0	0	0	0	0	0	0
regulatory (MP)	0.055							
global warming potential (GWP) for 100 yr ITH								
scientific relative to CO <sub>2</sub>	1790	1700	2100	2600	2500	2700	2100	2200
ASHRAE 34 / ISO 817 safety classification	A1	A1	A1	A1	A1	A1	A1	A1
ASHRAE 34 Refrigerant Concentration Limit (RCL) (lb/Mcf)	13	18	26	17	16	16	18	4.9

The grey regions of Table 6 and Table 7 indicate inapplicable data, namely the absence of composition-based glide based for the single-compound R-22. They also signify inapplicable data for blends not directly regulated by ozone depletion potential (ODP) in international treaties (notably the Montreal Protocol) and most regulations, though regulatory consequences result indirectly based on mass-weighted formulations of the blends.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	30507927
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau.
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	28-SEP-2017
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	18:04:25
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	3M_EOT.pdf	163277	no	2
			483e261393c67472707eec8faeea78c1b421ca8e		

**Warnings:** Case 5:20-cv-00142-FL Document 153-8 Filed 06/04/21 Page 172 of 383 171



Information:					
2	Amendment/Req. Reconsideration-After Non-Final Reject	Response_to_Non_Final_OA_ mailed_March_28__2017.pdf	857098  8bc3d8c55097166270084c6d8505072a2d0 aacd3	no	19
Warnings:					
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing					
Information:					
Total Files Size (in bytes):			1020375		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  <b>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</b></p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  <b>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</b></p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  <b>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</b></p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>		Docket Number (Optional) <b>821920-1032</b>
Application Number <b>13/493,491</b>	Filed <b>June 11, 2012</b>	
For <b>REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT</b>		
Art Unit <b>1761</b>	Examiner <b>Hardee, John R.</b>	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ _____
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ _____
<input checked="" type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ <u>700</u>
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____

☒ Applicant asserts small entity status. See 37 CFR 1.27.☐ Applicant certifies micro entity status. See 37 CFR 1.29.  
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.☐ A check in the amount of the fee is enclosed.☐ Payment by credit card. Form PTO-2038 is attached.☒ The Director has already been authorized to charge fees in this application to a Deposit Account.☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to  
Deposit Account Number 20-0778.☒ Payment made via EFS-Web.**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant.☒ attorney or agent of record. Registration number 29,526.☐ attorney or agent acting under 37 CFR 1.34. Registration number \_\_\_\_\_./Todd Deveau/

Signature

September 28, 2017

Date

Todd Deveau

Typed or printed name

770-933-9500

Telephone Number

**NOTE:** This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below\*.☐ \* Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875	Application or Docket Number <b>13/493,491</b>	Filing Date <b>06/11/2012</b>	<input type="checkbox"/> To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

**APPLICATION AS AMENDED – PART II**

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	09/28/2017	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X \$40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X \$210 =	0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE						<b>0</b>	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE  
TIA BENTLEY

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039
24504	7590	03/28/2017	EXAMINER	
THOMAS I HORSTEMEYER, LLP			HARDEE, JOHN R	
400 INTERSTATE NORTH PARKWAY SE			ART UNIT	PAPER NUMBER
SUITE 1500			1761	
ATLANTA, GA 30339			NOTIFICATION DATE	DELIVERY MODE
			03/28/2017	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@tkhr.com  
ozzie.liggins@tkhr.com  
docketing@thomashorstemeyer.com

<b>Office Action Summary</b>	<b>Application No.</b> 13/493,491	<b>Applicant(s)</b> PONDER ET AL.	
	<b>Examiner</b> JOHN HARDEE	<b>Art Unit</b> 1761	<b>AIA (First Inventor to File) Status</b> No

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 2/28/17.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims\*

- 5) ☒ Claim(s) 30-49 is/are pending in the application.  
5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 30-49 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

\* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

#### Certified copies:

- a) ☐ All    b) ☐ Some\*\*    c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)  
Paper No(s)/Mail Date 02282017.
- 3) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 4) ☐ Other: \_\_\_\_.

1. The present application is being examined under the pre-AIA first to invent provisions.

#### **DETAILED ACTION**

2. Claims 30-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takigawa et al., US 6,207,071. The reference discloses lubricating oil compositions and their use in compositions comprising R134a and R125 (col. 1, lines 13+). The reference further discloses the use of hydrofluorocarbons as replacements for hydrochlorofluorocarbons (col. 1, lines 20+). Suitable lubricants include the alkylbenzene oils described at col. 2, lines 30+. Refrigerants include alkane fluorides containing 40% or more of R134a in admixture with alkyl fluorides containing, most preferably, 40% or more of R125 (col. 8, lines 20+). The reference further discloses that there is “no restriction as to the kind of HFC to be mixed with” the disclosed refrigerants. The examiner takes the position that this can reasonably be construed to mean that no additional HFC need be added, and that the disclosure reads on refrigerant compositions *consisting of* 40-60% R134a and 60-40% of R125. Regarding language drawn to dew points and bubble points, such can be realized by working within the teachings of the reference, as the recited percentages of the recited refrigerants are obvious over the claims. Conventional additives may be added, including those disclosed at the top of col. 8. The examiner takes the position that anticorrosion additives are conventional, and that their use would be obvious over this disclosure. Lubricant compositions comprising naphthenic mineral oil and polyol polyesters are disclosed in Table 1. Note the disclosure in Evaluation Tests 2 and 3 of refrigerant being premixed with lubricant prior to charging a

compressor. The disclosed lubricating refrigerant compositions are useful in a variety of refrigeration apparatus, as disclosed at the top of col. 9. Determination of the lubrication-effective amount of a disclosed lubricant amounts to routine optimization. This reference differs from the claimed subject matter in that it does not disclose a composition which reads on appellant's claims with sufficient specificity to constitute anticipation.

It would have been obvious at the time the invention was made to make such a composition, because this reference teaches that all of the ingredients recited by appellants are suitable for inclusion in a refrigerant composition. The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified, absent a showing to the contrary.

In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed Cir. 1990).

### ***Response to Arguments***

3. Applicant's arguments filed February 28, 2017 have been fully considered but they are not persuasive. Arguments regarding chlorofluorocarbon substitutes versus hydrochlorofluorocarbons substitutes are well taken. As a courtesy to applicant, this action is NOT FINAL. Nonetheless, the reference does provide motivation to experiment within a relatively narrow range to find suitable hydrochlorofluorocarbons substitutes. The examiner has not argued, nor does he believe that all compositions falling within



this narrow range will behave identically. This is the purpose of experimentation, and the motivation provided in the reference is more explicit than an "obvious to try" standard. The reference implicitly discloses a refrigerant composition consisting of 40% of 1,1,1,2-tetrafluoroethane and 60% of pentafluoroethane at col. 8, line 39. This is the closest prior art. If applicant believes that compositions according to the current claims provide unexpected benefits over this composition, such should be demonstrated via timely filed declaration. Attorney arguments cannot take the place of evidence.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, Dr. John R. Hardee, whose telephone number is (571) 272-1318. The examiner can normally be reached on Monday through Friday from 8:00 until 4:30. In the event that the examiner is not available, his supervisor, Mr. Harold Pyon, may be reached at (571) 272-1498.

5. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8100. Please note that examiners may not accept or enter faxed amendments.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Art Unit: 1761

7. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/John R. Hardee/  
Primary Examiner  
March 21, 2017

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number	13493491
	Filing Date	2012-06-11
	First Named Inventor	Kenneth M. Ponder
	Art Unit	1761
	Examiner Name	Hardee, John R.
	Attorney Docket Number	821920-1032

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	13493491
Filing Date	2012-06-11
First Named Inventor	Kenneth M. Ponder
Art Unit	1761
Examiner Name	Hardee, John R.
Attorney Docket Number	821920-1032

1	List of refrigerants from Wikipedia, <a href="https://en.wikipedia.org/wiki/List_of_refrigerants">https://en.wikipedia.org/wiki/List_of_refrigerants</a> , last modified on 19 January 2017, 13 pages
2	Environmental Protection Agency (EPA), Air and Radiation Stratospheric Protection Division 6205J, "Substitute Refrigerants Under SNAP as of October 4, 2011", SNAP Information: <a href="http://www.epa.gov/ozone/snap">http://www.epa.gov/ozone/snap</a> , 18 pages
3	No date provided. Summary of Substitute Refrigerants Listed in SNAP Notice 25, 10 pages
4	ANSI/ASHRAE Addenda a, b, c, e, f, k, n, o, p, q, r, s, and u to ANSI/ASHRAE Standard 34-2004, "Designation and Safety Classification of Refrigerants", 2006 Supplement, ISSN 1041-2336, 35 pages

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**EXAMINER SIGNATURE**

Examiner Signature	/JOHN R HARDEE/	Date Considered	03/21/2017
--------------------	-----------------	-----------------	------------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.R.H/

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	13493491
Filing Date	2012-06-11
First Named Inventor	Kenneth M. Ponder
Art Unit	1761
Examiner Name	Hardee, John R.
Attorney Docket Number	821920-1032

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

None

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Todd Deveau/	Date (YYYY-MM-DD)	2017-02-28
Name/Print	Todd Deveau	Registration Number	29526

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application of:	Confirmation No.: 1039
Ponder et al.	Group Art Unit: 1761
Serial No.: 13/493,491	Examiner: Hardee, John R.
Filed: June 11, 2012	Docket No. 821920-1032
For: <b>REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT</b>	

**RESPONSE TO NON-FINAL OFFICE ACTION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

The Non-final Office Action from Examiner John R. Hardee mailed on August 29, 2016(Paper No./Mail Date 20160823), has been received and reviewed. Applicants provide the following amendments and remarks in response.

**AUTHORIZATION TO DEBIT ACCOUNT**

A petition for a 3-month extension of time is herein submitted. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including, but not limited to, fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 20-0778.

**IN THE CLAIMS:**

Please amend the claims as indicated hereafter wherein the changes are shown by strikethrough or double brackets for deleted matter and underlining for added matter.

1 – 29. (Cancelled)

30. (Currently Amended) In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein in the substitute refrigerant said pentafluoroethane is present in an amount ~~less than 60% of 59% to 57%~~ by weight and said tetrafluoroethane is present in an amount ~~greater than 40% of 41% to 43%~~ by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethanes wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.



31. (Previously Presented) In the apparatus of claim 30, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

32. (Concurrently Amended) A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute refrigerant composition designed to achieve a phase change and comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein in the substitute refrigerant said pentafluoroethane is present in an amount ~~less than 60%~~59% to 57% by weight and said tetrafluoroethane is present in an amount ~~greater than 40%~~41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%.

(2) supplying the substitute refrigerant composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

(3) adding to said apparatus via the manifold the substitute refrigerant composition for chlorodifluoromethane, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

33. (Previously Presented) The method of claim 32, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

34. (Currently Amended) A refrigerant composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure,

wherein in the substitute refrigerant said pentafluoroethane is present in an amount ~~less than 60%~~of 59% to 57% by weight and said tetrafluoroethane is present in an amount ~~greater than 40%~~of 41% to 43% by weight of the combined weight of the pentafluoroethane and tetrafluoroethane on the basis of the combined weights of said pentafluoroethane and said tetrafluoroethane totaling 100%, and

wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

35. (Previously Presented) The refrigerant composition of claim 34, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

36. (Previously Presented) The refrigerant composition according to claim 34, wherein the lubricating oil includes an additive selected from the group consisting of further includes an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.
37. (Previously Presented) In the apparatus of claim 30, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.
38. (Previously Presented) In the apparatus of claim 30, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.
39. (Previously Presented) The method according to claim 32, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.
40. (Previously Presented) The method according to claim 32, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.
41. (Previously Presented) In the apparatus of claim 30, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
42. (Previously Presented) The method of claim 32, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.

43. (Previously Presented) The refrigerant composition of claim 34, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.

44. (Previously Presented) In the apparatus of claim 41, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

45. (Previously Presented) The method according to claim 42, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

46. (Previously Presented) The refrigerant composition according to claim 43, wherein said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

47. (Previously Presented) In the apparatus of claim 30, wherein the blend exhibits a glide at about 9.5°F.

48. (Previously Presented) The method of claim 32, wherein the blend exhibits a glide at about 9.5°F.

49. (Previously Presented) The refrigerant composition of claim 34, wherein the blend exhibits a glide at about 9.5°F.

### REMARKS

The Office Action presents following single point, namely: claims 30-49 stand rejected under 35 USC 103(a) as obvious in view of US 6,207,071 (Takigawa et al.).

Claims 30-49 are pending. Claims 30, 32 and 34 are amended herein. Applicants respectfully request reconsideration and withdrawal of the rejection based upon the amendments and remarks presented herein.

The Examiner's Response to Arguments at page 4 of the Non-final Office Action demonstrates a multiple fundamental misconceptions of the present invention. First, Applicants note the statement: "If optimizing a refrigerant composition to be as CFC-like as possible places it outside the recited ranges of dew point and bubble point, such should be demonstrated via timely filed declaration. This statement demonstrates a misunderstanding of the present invention. The present invention is not a CFC refrigerant substitute. It is intended as a substitute chlorodifluoromethane which is not a CFC refrigerant. And –in fact- as shown below, the refrigerant of the present claims is not accepted by the EPA as a substitute or a replacement for CFC-11.

In fact, the cited reference, Takigawa, provides no teaching that any of its thousands, if not millions, of possible combinations of refrigerants described therein are suitable as a replacement for any particular CFC refrigerant. Submitted herewith is a List of Refrigerants printed from Wikipedia (see the Supplemental Information Statement (IDS) submitted herewith).

The List includes, among others, the following CFC refrigerants:

CFC R-11	Trichlorofluoromethane
CFC R-12	Dichlorodifluoromethane
CFC R-13	Chlorotrifluoromethane
CFC R-111	Pentachlorofluoroethane
CFC R-112	1,1,2,2-Tetrachloro-1,2-difluoroethane
CFC R-112a	1,1,1,2-Tetrachloro-2,2-difluoroethane
CFC R-113	1,1,2-Trichloro-1,2,2-trifluoroethane
CFC R-113a	1,1,1-Trichloro-2,2,2-trifluoroethane
CFC R-114	1,2-Dichlorotetrafluoroethane
CFC R-114a	1,1-Dichlorotetrafluoroethane
CFC R-115	Chloropentafluoroethane

CFC R-211	1,1,1,2,2,3,3-Heptachloro-3-fluoropropane
CFC R-212	Hexachlorodifluoropropane
CFC R-213	1,1,1,3,3-Pentachloro-2,2,3-trifluoropropane
CFC R-214	1,2,2,3-Tetrachloro-1,1,3,3-tetrafluoropropane
CFC R-215	1,1,1-Trichloro-2,2,3,3,3-pentafluoropropane
CFC R-216	1,2-Dichloro-1,1,2,3,3,3-hexafluoropropane
CFC R-216ca	1,3-Dichloro-1,1,2,2,3,3-hexafluoropropane
CFC R-217	1-Chloro-1,1,2,2,3,3,3-heptafluoropropane
CFC R-217ba	2-Chloro-1,1,1,2,3,3,3-heptafluoropropane

There is no teaching whatsoever in Takigawa of a substitute refrigerant for any of these CFC refrigerants let alone which of the large member of possible refrigerants in Takigawa could be used as a substitute for which ones of these CFC's.

Also submitted with the Supplemental IDS herewith are copies of the EPA's listing of Substitute Refrigerants Under SNAP as of October 4, 2011 that provides a list of acceptable substitutes for Class I (CFCs) under the SNAP program as of October 4, 2011 and the EPA's Summary of Substitute Refrigerants Listed in SNAP Notice 25 providing a listing of refrigerant substitutes for HCFC-22 (chlorodifluoromethane). Comparing the two lists one finds the following comparison of many refrigerants that are listed as a suitable replacement for one but not the other. Examples are provided in Tables 1 and 2 below.

Table 1  
In Air Conditioning

	CFC	HCFC-22
HCFC 123	Yes	No
HCFC 125	Yes	No
HFC 236	Yes	No
R-290	No	Yes
R401A,B	Yes	No
R404A	No	Yes
R-406A	Yes	No
R407A	No	Yes
R409A	Yes	No
R410A,B	No	Yes
R416A	No	No
R417A	No	Yes
R421A	No	Yes
R422B	No	Yes
R424A	No	Yes

Table 2  
In Commercial Refrigeration

	CFC	HCFC-22
HCFC 22	Yes	No
HCFC 152B	No	Yes
HFC 236	Yes	No
R290	No	Yes
R401A,B	Yes	No
R402A,B	Yes	No
R406A	Yes	No
R408A	Yes	No
R409	Yes	No
R410A,B	No	Yes
R411A,B	Yes	No
R416A	No	No
R417A	No	Yes
R421A	No	Yes
R422B	No	Yes
R424A	No	Yes

Thus, just because a refrigerant may be suitable or acceptable as a replacement for some CFC refrigerant, that either Takigawa nor the Examiner identifies, does not automatically render it suitable for replacement of an HCFC refrigerant, and vice versa. In fact R416A (134a/125/600 in the ratio 59.0 (+0.5, -1.0)/39.5 (+1.0,-0.5)/1.5 (+1.0,-0.5) is not listed as a suitable replacement for either CFC-11 or HCFC-22. Further, there is simply no teaching or suggestion for such in Takigawa.



Applicants further note the statement at page 4 of the Office Action “the reference [Takigawa] provides motivation to make compositions to within a fairly narrow range of percentages which are suitable replacements for chlorofluorocarbon [(CFC)] refrigerants”. The Examiner, is however, is being inconsistent. The Examiner is relying on Takigawa as teaching a range or variance of over 20% by weight for the various refrigerant ingredients. As previously demonstrated in Applicants’ last Response, the ASHRAE refrigerant Standard shows that a 20% variance in the amount of a refrigerant ingredient in refrigerant composition is unacceptable. In the context of the actual refrigerant world, Takigawa provides no such teaching of a “narrow range of percentages which are suitable replacements for chlorofluorocarbon refrigerants” when according to the Examiner’s characterization of Takigawa the ranges can vary 20%.

In this regard, Applicants note the further statement at page 4: “In addition, the ASHRAE standard has not been made of record.” Applicants respectfully disagree as the applicable ASHRAE Standard has previously been submitted and is of record in the parent case of which the present case is a continuation and therefore part of the present record. Nevertheless, Applicants submit herewith (see Supplemental IDS) a copy of the ANSI/ASHRAE Addenda a, b, c, e, f, k, n, o, p, q, r, s, and u to ANSI/ASHRAE Standard 34-2004. Reference to this document shows that a variation of 20% of a refrigerant gas in a refrigerant composition is unacceptable and, in fact, would cover multiple distinctly different refrigerant compositions.

A further misconception of the present invention is demonstrated by the following additional statement at page 4: “Applicant’s arguments regarding R-421A are not persuasive, because the Examiner has not rejected the claims over R-421A.” This statement is nonsensical as R-421A is Applicants’ invention, as recited in the present claims. Applicants previously presented data showing for example, significant differences from a 60:40 composition as compared to Applicants’ R-421A composition of 58%  $\pm$ 1% and 42%  $\pm$ 1% (see p. 13 of the ANSI/ASHRAE Addenda).

Moreover referring again to the “Summary of Substitute Refrigerants Listed in SNAP Notice 25,” Applicants previously noted to the Office that their present invention has received SNAP approval as a replacement for HCFC-22, but not CFC-11. The Summary includes a Table of SNAP approved refrigerant substitutes for HCFC-22 (chlorodifluoromethane) that lists approximately 45 to 50 differing refrigerant blends that are all approved substitutes for HCFC-22, including Applicants’ present invention. This SNAP listing refutes the Examiner’s reliance on the present invention being a “mere” optimization of the teachings of Takigawa, or stated in another way that it is simply “obvious to try” the teachings of Takigawa to arrive at the present invention. In view of the number of refrigerants listed as acceptable substitutes it appears the odds would be extremely low that one would arrive at Applicants’ refrigerant based on Takigawa.

Included in this SNAP listing are numerous blends of refrigerants that comprise pentafluoroethane (R-125) and tetrafluoroethane (R-134A). Further, many of such refrigerants include pentafluoroethane in a range between 60 to 40% and tetrafluoroethane in a range of 40 to 60% such as: 1) R125/R290/R134A/R600A in a ratio of 55.01/1/42.5/1.5% by weight; 2) R32/R125/R134A in a ratio of 20/40/40% by weight (known as R407A); 3) R125/R134A/R600A in a ratio of 46.6/50.0/3.4% by weight (R417A); 4) R125/R134A/R600A in a ratio of 55.0/42.0/3.0 (R422B); 5) R125/R134A/R600A/R600/R601A in a ratio of 50.5/47.0/0.9/1.0/0.6% by weight (R424A); and 6) R125/R134A in a ratio of 50/50% by weight (R507A). As seen by the ASHRAE “R” designations, each of these refrigerant blends or compositions is considered by ASHRAE to be a different refrigerant offering properties different from those of the other ASHRAE designated refrigerants.

Thus, as shown herein, the Examiner’s reliance on the statement: “The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified” in Takigawa is not correct. As shown,

Applicants' recited composition does not have properties similar to those compositions which according to the Examiner would also be exemplified in *Takigawa et al.*

**CONCLUSION**

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed and that all pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

**THOMAS | HORSTEMEYER, LLP**

By: /Todd Deveau/  
**Todd Deveau**  
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## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	13493491			
<b>Filing Date:</b>	11-Jun-2012			
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder			
<b>Filer:</b>	Todd Deveau.			
<b>Attorney Docket Number:</b>	821920-1032			
Filed as Small Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	700	700
<b>Miscellaneous:</b>				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	90	90
<b>Total in USD (\$)</b>				<b>790</b>

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	28491802
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau.
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	28-FEB-2017
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	17:23:39
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

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<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	EOT.pdf	151551	no	2
			b421b5d10ee3df2fb3cae89f762739ac804fe73a		
<b>Warnings:</b>					
<b>Information:</b>					
2	Transmittal Letter	IDS.pdf	98478	no	2
			8a7f227addcbb2a944f558168256bd4780414c5		
<b>Warnings:</b>					
<b>Information:</b>					
3	Information Disclosure Statement (IDS) Form (SB08)	IDS_Form_1449.pdf	614976	no	4
			de8fd76d01a5591ab948879f1e8bd645009ff561		
<b>Warnings:</b>					
<b>Information:</b>					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
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			8604eecb1ed19c5639441fe68b0c7e1525dde2f2		
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5	Non Patent Literature	Ref2.pdf	1452378	no	18
			8a71bae44f761a1142be91f39249c84796805498		
<b>Warnings:</b>					
<b>Information:</b>					

6	Non Patent Literature	Ref3.pdf	361311	no	10
			4c4c102c4d969d48a7fa88118c89180524c21f1b		
<b>Warnings:</b>					
<b>Information:</b>					
7	Non Patent Literature	Ref4.pdf	2513008	no	35
			d63e0d460399b496d273b700f5c8d27a1a86c0df		
<b>Warnings:</b>					
<b>Information:</b>					
8	Amendment/Req. Reconsideration-After Non-Final Reject	Response_to_Nonfinal_OA.pdf	125862	no	13
			04273d87257b941979beda44a76c036aaa762bd8		
<b>Warnings:</b>					
<b>Information:</b>					
9	Fee Worksheet (SB06)	fee-info.pdf	32557	no	2
			cfeaf6403a0ebec029987ee25620606f6109f864		
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			6929415		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>		Docket Number (Optional) <b>821920-1032</b>
Application Number <b>13/493,491</b>	Filed <b>June 11, 2012</b>	
For <b>REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT</b>		
Art Unit <b>1761</b>	Examiner <b>Hardee, John R.</b>	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ _____
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ _____
<input checked="" type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ <u>700</u>
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____

☐ Applicant asserts small entity status. See 37 CFR 1.27.☐ Applicant certifies micro entity status. See 37 CFR 1.29.  
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.☐ A check in the amount of the fee is enclosed.☒ Payment by credit card. Form PTO-2038 is attached.☐ The Director has already been authorized to charge fees in this application to a Deposit Account.☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to  
Deposit Account Number 20-0778.☒ Payment made via EFS-Web.**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant.☒ attorney or agent of record. Registration number 29,526.☐ attorney or agent acting under 37 CFR 1.34. Registration number \_\_\_\_\_./Todd Deveau/

Signature

February 28, 2017

Date

Todd Deveau

Typed or printed name

770-933-9500

Telephone Number

**NOTE:** This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below\*.☐ \* Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Confirmation No.: 1039

Ponder et al.

Group Art Unit: 1761

Serial No.: 13/493,491

Examiner: Hardee, John R.

Filed: June 11, 2012

Docket No. 821920-1032

For: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

This information disclosure statement is filed in accordance with 37 C.F.R. §§ 1.56, 1.97, and 1.98, and specifically:

- ☐ under 37 CFR 1.97(b), or  
(within Three months of filing national application; or date of entry of international application;  
or before mailing date of first office action on the merits; whichever occurs last)
- ☒ under 37 CFR 1.97(c) together with either a:  
☐ Statement Under 37 C.F.R. 1.97(e), or  
☒ a \$90 fee under 37 CFR 1.17(p).  
(After the CFR 1.97(b) time period, but before the final office action or notice of  
allowance, whichever occurs first)
- ☐ under 37 CFR 1.97(d) together with a:  
☐ Statement under 37 CFR 1.97(e), and  
☐ a \$\_\_\_\_ petition fee set forth in 37 CFR 1.17(p).  
(Filed after final office action or notice of allowance, whichever occurs first, but  
before payment of the issue fee)
- ☐ Enclosed is a check in the amount of \$\_\_\_\_\_.
- ☐ Payment by credit card.
- ☐ Please charge \$\_\_\_\_\_ to deposit account 20-0778.
- ☒ At any time during the pendency of this application, please charge any fees required to Deposit  
Account 20-0778 pursuant to 37 CFR 1.25. The Commissioner is hereby requested to credit any  
overpayment to Deposit Account No. 20-0778.

- ☒ Applicant(s) submit herewith *Form PTO SB/08A-08B-08a - Information Disclosure Statement by Applicant* together with copies (where required) of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may or may not be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56. As required by 37 C.F.R. §1.98(a), a legible copy of each document is provided.
- ☐ A concise explanation of the relevance of foreign language patents, foreign language publications and other foreign language information listed on PTO Form SB/08A-08B-08a, as presently understood by the individual(s) designated in 37 CFR 1.56(c) most knowledgeable about the content is given on the attached sheet, or where a foreign language patent is cited in a search report or other action by a foreign patent office in a counterpart foreign application, an English language version of the search report or action which indicates the degree of relevance found by the foreign office is listed on the form PTO SB/08A-08B-08a and is enclosed herewith.

The following rights are reserved by the Applicant(s): the right to establish the patentability of the claimed invention over any of the listed documents should they be applied as reference, and/or the right to prove that some of these documents may not be prior art, and/or the right to prove that some of these documents may not be enabling for the teachings they purport to offer.

This statement should not be construed as a representation that an exhaustive search has been made, or that information more material to the examination of the present application does not exist. Any statements or identifications regarding the relevance of any portion(s) of cited references should not be construed as a representation that the most relevant portion(s) have been identified, and the absence of such statements or identifications should not be construed as representations that there are no relevant portion(s). The Examiner is specifically requested not to rely solely on the materials submitted herewith. The Examiner is requested to conduct an independent and thorough review of the documents, and to form independent opinions as to their significance.

It is requested that the information disclosed herein be made of record in this application and that the Examiner initial and return a copy of the enclosed PTO SB/08A-08B-08a to indicate the documents have been considered.

Respectfully submitted,

Thomas|Horstemeyer, LLP

By: /Todd Deveau/  
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# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** ( Not for submission under 37 CFR 1.99)

Application Number	13493491
Filing Date	2012-06-11
First Named Inventor	Kenneth M. Ponder
Art Unit	1761
Examiner Name	Hardee, John R.
Attorney Docket Number	821920-1032

## **U.S. PATENTS**

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Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
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	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>5</sup>

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	13493491
Filing Date	2012-06-11
First Named Inventor	Kenneth M. Ponder
Art Unit	1761
Examiner Name	Hardee, John R.
Attorney Docket Number	821920-1032

1	List of refrigerants from Wikipedia, <a href="https://en.wikipedia.org/wiki/List_of_refrigerants">https://en.wikipedia.org/wiki/List_of_refrigerants</a> , last modified on 19 January 2017, 13 pages
2	Environmental Protection Agency (EPA), Air and Radiation Stratospheric Protection Division 6205J, "Substitute Refrigerants Under SNAP as of October 4, 2011", SNAP Information: <a href="http://www.epa.gov/ozone/snap">http://www.epa.gov/ozone/snap</a> , 18 pages
3	Summary of Substitute Refrigerants Listed in SNAP Notice 25, 10 pages
4	ANSI/ASHRAE Addenda a, b, c, e, f, k, n, o, p, q, r, s, and u to ANSI/ASHRAE Standard 34-2004, "Designation and Safety Classification of Refrigerants", 2006 Supplement, ISSN 1041-2336, 35 pages

If you wish to add additional non-patent literature document citation information please click the Add button

**EXAMINER SIGNATURE**

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	13493491
Filing Date	2012-06-11
First Named Inventor	Kenneth M. Ponder
Art Unit	1761
Examiner Name	Hardee, John R.
Attorney Docket Number	821920-1032

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

None

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Todd Deveau/	Date (YYYY-MM-DD)	2017-02-28
Name/Print	Todd Deveau	Registration Number	29526

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



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<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875	Application or Docket Number <b>13/493,491</b>	Filing Date <b>06/11/2012</b>	<input type="checkbox"/> To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

**APPLICATION AS AMENDED – PART II**

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	02/28/2017	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X \$40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	X \$210 =	0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE						<b>0</b>	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE  
SHARAIN MORELAND

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039
24504	7590	08/29/2016	EXAMINER	
THOMAS I HORSTEMEYER, LLP			HARDEE, JOHN R	
400 INTERSTATE NORTH PARKWAY SE			ART UNIT	PAPER NUMBER
SUITE 1500			1761	
ATLANTA, GA 30339			NOTIFICATION DATE	DELIVERY MODE
			08/29/2016	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@tkhr.com  
ozzie.liggins@tkhr.com  
docketing@thomashorstemeyer.com

<p align="center"><b>Office Action Summary</b></p>	<b>Application No.</b> 13/493,491	<b>Applicant(s)</b> PONDER ET AL.	
	<b>Examiner</b> JOHN HARDEE	<b>Art Unit</b> 1761	<b>AIA (First Inventor to File) Status</b> No

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 7/26/16.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims\*

- 5) ☒ Claim(s) 30-49 is/are pending in the application.  
     5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 30-49 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

\* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

#### Certified copies:

- a) ☐ All    b) ☐ Some\*\*    c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 3) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)<br>Paper No(s)/Mail Date ____. | 4) <input type="checkbox"/> Other: ____.  |

1. The present application is being examined under the pre-AIA first to invent provisions.

#### **DETAILED ACTION**

##### ***Continued Examination Under 37 CFR 1.114***

2. Applicant's petition for revival, submitted March 24, 2016, was granted on July 26, 2016. *Ex parte* prosecution is resumed.

##### ***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 30-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takigawa et al., US 6,207,071. The reference discloses lubricating oil compositions and their use in compositions comprising R134a and R125 (col. 1, lines 13+). The reference further discloses the use of hydrofluorocarbons as replacements for chlorofluorocarbons (col. 1, lines 20+). Suitable lubricants include the alkylbenzene oils described at col. 2, lines 30+. Refrigerants include alkane fluorides containing 40% or more of R134a in admixture with alkyl fluorides containing, most preferably, 40% or more of R125 (col. 8, lines 20+). The reference further discloses that there is "no restriction as to the kind of HFC to be mixed with" the disclosed refrigerants. The examiner takes the position that this can reasonably be construed to mean that no additional HFC need be added, and that the disclosure reads on refrigerant compositions *consisting of* 40-60% R134a and 60-40% of R125. Regarding language drawn to dew points and bubble points, such

Art Unit: 1761

can be realized by working within the teachings of the reference, as the recited percentages of the recited refrigerants are obvious over the claims. Conventional additives may be added, including those disclosed at the top of col. 8. The examiner takes the position that anticorrosion additives are conventional, and that their use would be obvious over this disclosure. Lubricant compositions comprising naphthenic mineral oil and polyol polyesters are disclosed in Table 1. Note the disclosure in Evaluation Tests 2 and 3 of refrigerant being premixed with lubricant prior to charging a compressor. The disclosed lubricating refrigerant compositions are useful in a variety of refrigeration apparatus, as disclosed at the top of col. 9. Determination of the lubrication-effective amount of a disclosed lubricant amounts to routine optimization. This reference differs from the claimed subject matter in that it does not disclose a composition which reads on appellant's claims with sufficient specificity to constitute anticipation.

It would have been obvious at the time the invention was made to make such a composition, because this reference teaches that all of the ingredients recited by appellants are suitable for inclusion in a refrigerant composition. The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified, absent a showing to the contrary.

In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed Cir. 1990).

***Response to Arguments***

5. Applicant's arguments filed March 24, 2016 have been fully considered but they are not persuasive. Applicant argues that the Takigawa reference does not disclose dew points or bubble points. The examiner has acknowledged this. Nonetheless, the reference provides motivation to make compositions within a fairly narrow range of percentages which are suitable replacements for chlorofluorocarbon refrigerants. If optimizing a refrigerant composition to be as CFC-like as possible places it outside the recited ranges of dew point and bubble point, such should be demonstrated via timely filed declaration.

Applicant's arguments regarding R-421A are not persuasive, because the examiner has not rejected the claims over R-421A. If applicant believes that a 58:42 composition is significantly different from a 60:40 composition, such should be demonstrated via declaration. Attorney arguments cannot take the place of evidence. In addition, the ASHRAE standard has not been made of record.

The declaration of Kenneth Ponder, discussed previously, remains unpersuasive for the reasons of record. The declaration is drawn largely to the properties of R-421B refrigerant. R-421B is not the closest prior art. Regarding Mr. Ponder's opinions of the obviousness of the claims over the Takigawa reference, a declarant or affiant's opinion evidence as to an ultimate legal conclusion is afforded no weight, though the underlying reasons for the opinion may be considered. *In re Lindell*, 385 F.2d 453, 456 (CCPA 1967).

6. Any inquiry concerning this communication or earlier communications from the

Art Unit: 1761

examiner should be directed to the examiner, Dr. John R. Hardee, whose telephone number is (571) 272-1318. The examiner can normally be reached on Monday through Friday from 8:00 until 4:30. In the event that the examiner is not available, his supervisor, Mr. Harold Pyon, may be reached at (571) 272-1498.

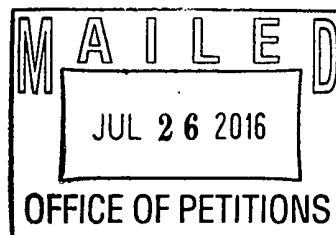
The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8100. Please note that examiners may not accept or enter faxed amendments.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/John R. Hardee/  
Primary Examiner  
August 23, 2016



THOMAS | HORSTEMEYER, LLP  
400 INTERSTATE NORTH PARKWAY SE  
SUITE 1500  
ATLANTA GA 30339



In re Application of	:	
Kenneth M. Ponder, et al.	:	
Application No. 13/493491	:	DECISION ON PETITION
Filed: June 11, 2012	:	
Attorney Docket No. 821920-1032	:	

This is a decision on the petition filed March 24, 2016, pursuant to 37 CFR 1.137(a).

The petition is **GRANTED**.

The above-identified application became abandoned for failure to file a timely and proper reply to the final Office action mailed September 9, 2013. This Office action set a shortened statutory period for reply of three months. Applicant filed a Request for Continued Examination (RCE) under 37 CFR 1.114 on Monday, March 10, 2014, made timely by a three month extension of time. However, by Notice of Improper RCE mailed on March 13, 2014 the Examiner of record informed Applicant that the RCE was filed timely but improper because Applicant failed to file the submission required under 37CFR 1.114 with the RCE. This Notice set no new time period for reply. As such, the application became abandoned by operation of law on March 10, 2014. The Office mailed a Notice of Abandonment on March 24, 2014.

With the instant petition, Applicant paid the petition fee, made the proper statement of unintentional delay, and submitted a reply in the form of an amendment satisfying the requirements of a submission under 37 CFR 1.114.

The above-identified application has been abandoned for an extended period of time. The Patent and Trademark Office is relying on petitioner's duty of candor and good faith and accepting the statement that the entire delay in filing the required reply from the due date for the reply until the filing of a grantable petition pursuant to 37 CFR 1.137(a) was unintentional.<sup>1</sup>

<sup>1</sup> See Changes to Patent Practice and Procedure, 62 Fed. Reg. at 53160 and 53178, 1203 Off. Gaz. Pat. Office at 88 and 103 (responses to comments 64 and 109) (applicant obligated under 37 CFR 10.18 to inquire into the underlying facts and circumstances when providing the statement required by 37 CFR 1.137(b) to the Patent and Trademark Office).



The application is being forwarded to Group Art Unit 1761 for consideration of the Amendment under 37 CFR 1.114 filed on March 24, 2016 and the RCE under 37 CFR 1.114 previously filed on March 10, 2014.

Telephone inquiries specific to this matter should be directed to Jonya Smalls, Paralegal Specialist at (571) 272-1619.

/Christina Tartera Donnell/

Christina Tartera Donnell  
Attorney Advisor  
Office of Petitions

Enclosed: PTOL-303 Advisory Action

<b>Advisory Action</b> <b>Before the Filing of an Appeal Brief</b>	<b>Application No.</b> 13/493,491	<b>Applicant(s)</b> PONDER ET AL.	
	<b>Examiner</b> JOHN HARDEE	<b>Art Unit</b> 1761	<b>AIA (First Inventor to File) Status</b> No

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 24 March 2016 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

**NO NOTICE OF APPEAL FILED**

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☒ The period for reply expires 6 months from the mailing date of the final rejection.

b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires \_\_\_\_\_ months from the mailing date of the prior Advisory Action or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

*Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).*

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**NOTICE OF APPEAL**

2. ☐ The Notice of Appeal was filed on \_\_\_\_\_. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

**AMENDMENTS**

3. ☐ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because

a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);

b) ☐ They raise the issue of new matter (see NOTE below);

c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.

6. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☒ For purposes of appeal, the proposed amendment(s): (a) ☐ will not be entered, or (b) ☒ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

**AFFIDAVIT OR OTHER EVIDENCE**

8. ☐ A declaration(s)/affidavit(s) under 37 CFR 1.130(b) was/were filed on \_\_\_\_\_.

9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

**REQUEST FOR RECONSIDERATION/OTHER**

12. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: \_\_\_\_\_.

13. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). \_\_\_\_\_

14. ☒ Other: See Continuation Sheet.

**STATUS OF CLAIMS**

15. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: \_\_\_\_\_

Claim(s) objected to: \_\_\_\_\_

Claim(s) rejected: 30-49.

Claim(s) withdrawn from consideration: \_\_\_\_\_

/JOHN HARDEE/  
 Primary Examiner, Art Unit 1761

Continuation of 14. Other: The claims remain rejected for the reasons of record. The newly added limitations narrow the percentages to a range made obvious by the reference..

**PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT  
ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(a)**

Page 1 of 2

Docket Number (Optional)

821920-1032

First named inventor: Kenneth M. PonderApplication No.: 13/493,491Art Unit: 1761Filed: June 11, 2012Examiner: Hardee, John R.Title: **REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22  
REFRIGERANT**

Attention: Office of Petitions

**Mail Stop Petition**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

FAX (571) 273-8300

NOTE: If information or assistance is needed in completing this form, please contact the Office of Petitions at (571) 272-3282.

The above-identified application became abandoned for failure to file a timely and proper reply to a notice or action by the United States Patent and Trademark Office. The date of abandonment is the day after the expiration date of the period set for reply in the Office notice or action plus any extensions of time actually obtained.

**APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION.**

NOTE: A grantable petition requires the following items:

- (1) Petition fee;
- (2) Reply and/or issue fee;
- (3) Terminal disclaimer with disclaimer fee – required for all utility and plant applications filed before June 8, 1995, and for all design applications; and
- (4) Statement that the entire delay was unintentional.

**1. Petition fee**
☒ Small entity fee \$ 850 (37 CFR 1.17(m)). Applicant asserts small entity status. See 37 CFR 1.27.

☐ Undiscounted fee \$ \_\_\_\_\_ (37.CFR.1.17(m)).
**2. Reply and/or fee**

A The reply and/or fee to the above-noted Office notice or action in the form of

Response to Final OA (identify the type of reply):

☐ has been filed previously on \_\_\_\_\_.

☒ is enclosed herewith.

B The issue fee and publication fee (if applicable) of \$ \_\_\_\_\_

☐ has been paid previously on \_\_\_\_\_.

☐ is enclosed herewith.

This collection of information is required by 37 CFR 1.137(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 1 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

# **PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(a)**

Page 2 of 2

## **3. Terminal disclaimer with disclaimer fee**

- ☒ Since this utility/plant application was filed on or after June 8, 1995, no terminal disclaimer is required.
- ☐ A terminal disclaimer (and disclaimer fee (37 CFR 1.20(d)) of \$ \_\_\_\_\_) disclaiming the required period of time is enclosed herewith (see PTO/SB/63).

**4. STATEMENT:** The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 CFR 1.137(a) was unintentional. [NOTE: The United States Patent and Trademark Office may require additional information if there is a question as to whether either the abandonment or the delay in filing a petition under 37 CFR 1.137(a) was unintentional (MPEP 711.03(c), subsections (III)(C) and (D)).]

### **WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

/Todd Deveau/

Signature

March 24, 2016

Date

Todd Deveau

Typed or Printed Name

29,526

Registration Number, if applicable

770-933-9500

Telephone Number

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

### **Enclosures:**

- ☐ Fee Payment
- ☒ Reply
- ☐ Terminal Disclaimer Form
- ☐ Additional sheet(s) containing statements establishing unintentional delay
- ☐ Other: \_\_\_\_\_

### **CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]**

I hereby certify that this correspondence is being:

- ☐ Deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Petition, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.
- ☒ Transmitted by EFS-Web or facsimile on the date shown below to the United States Patent and Trademark Office at (571) 273-8300.

March 24, 2016

Date

/Amy Kwon/

Signature

Amy Kwon

Typed or printed name of person signing certificate

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	13493491			
<b>Filing Date:</b>	11-Jun-2012			
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder			
<b>Filer:</b>	Todd Deveau.			
<b>Attorney Docket Number:</b>	821920-1032			
Filed as Small Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
Pet. Revive Abandon App, Delay Pymt-Resp	2453	1	850	850
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Extension-of-Time:</b>				
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>850</b>



## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	25291628
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau.
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	24-MAR-2016
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	10:35:48
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$850
RAM confirmation Number	24203
Deposit Account	200778
Authorized User	DEVEAU, TODD

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

<b>File Listing:</b>					
<b>Document Number</b>	<b>Document Description</b>	<b>File Name</b>	<b>File Size(Bytes)/ Message Digest</b>	<b>Multi Part /.zip</b>	<b>Pages (if appl.)</b>
1	Response After Final Action	8219201032_Response_to_FOA.pdf	224458 bd1a284f456812a4f4766e853505f93235771319	no	17
<b>Warnings:</b>					
<b>Information:</b>					
2	Petition for review by the Office of Petitions	Petition_for_Revival_of_an_Application_1.pdf	252548 719c1ba32613fe2ab9992877c89ec98899767fb3	no	3
<b>Warnings:</b>					
<b>Information:</b>					
3	Fee Worksheet (SB06)	fee-info.pdf	30622 5f7ae1537b7cbfc542b27bc236c805ada427652c	no	2
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			507628		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application of:	Confirmation No.: 1039
Ponder et al.	Group Art Unit: 1761
Serial No.: 13/493,491	Examiner: Hardee, John R.
Filed: June 11, 2012	Docket No. 821920-1032
For:	<b>REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT</b>

**RESPONSE TO FINAL OFFICE ACTION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

The final Office Action from Examiner John R. Hardee mailed on September 9, 2013 (Paper No./Mail Date 20130829), has been received and reviewed. Applicant provides the following amendments and remarks in response.

**AUTHORIZATION TO DEBIT ACCOUNT**

It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including, but not limited to, fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 20-0778.

**IN THE CLAIMS:**

Please amend the claims as indicated hereafter wherein the changes are shown by strikethrough or double brackets for deleted matter and underlining for added matter.

1 – 29. (Cancelled)

30. (Currently Amended) In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure,  
wherein in the substitute refrigerant said pentafluoroethane is present in an amount less than 60% by weight and said tetrafluoroethane is present in an amount greater than 40% by weight of the combined weight of the pentafluoroethane tetrafluoroethane, and  
wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethanes wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

31. (Previously presented) In the apparatus of claim 30, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

32. (Currently Amended) A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute refrigerant composition designed to achieve a phase change and comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein in the substitute refrigerant said pentafluoroethane is present in an amount less than 60% by weight and said tetrafluoroethane is present in an amount greater than 40% by weight of the combined weight of the pentafluoroethane tetrafluoroethane.

(2) supplying a the substitute refrigerant composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

(3) adding to said apparatus via the manifold the substitute refrigerant composition for chlorodifluoromethane, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

33. (Previously presented) The method of claim 32, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

34. (Currently Amended) A refrigerant composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend

exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure,

wherein in the substitute refrigerant said pentafluoroethane is present in an amount less than 60% by weight and said tetrafluoroethane is present in an amount greater than 40% by weight of the combined weight of the pentafluoroethane tetrafluoroethane, and

wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

35. (Previously presented) The refrigerant composition of claim 34, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

36. (Previously presented) The refrigerant composition according to claim 34, wherein the lubricating oil includes an additive selected from the group consisting of further includes an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

37. (Previously presented) In the apparatus of claim 30, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

38. (Previously presented) In the apparatus of claim 30, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

39. (Previously presented) The method according to claim 32, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.
40. (Previously presented) The method according to claim 32, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibit, a surfactant, a foaming agent, and mixtures thereof.
41. (Previously presented) In the apparatus of claim 30, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
42. (Previously presented) The method of claim 32, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
43. (Previously presented) The refrigerant composition of claim 34, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
44. (Previously presented) In the apparatus of claim 41, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.
45. (Previously presented) The method according to claim 42, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

46. (Previously presented) The refrigerant composition according to claim 43, wherein said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

47. (Previously presented) In the apparatus of claim 30, wherein the blend exhibits a glide at about 9.5°F.

48. (Previously presented) The method of claim 32, wherein the blend exhibits a glide at about 9.5°F.

49. (Previously presented) The refrigerant composition of claim 34, wherein the blend exhibits a glide at about 9.5°F.



### **REMARKS**

The Office Action presents following single point, namely: claims 30-49 stand rejected under 35 USC 103(a) as obvious in view of US 6,207,071 (*Takigawa et al.*).

Claims 30-49 are pending. Claims 30, 32 and 34 are amended herein. Applicant respectfully requests reconsideration and withdrawal of the rejections based upon the amendment and remarks presented herein.

### **Legal Standard**

“Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). “Where...the necessary reasoning is absent, we cannot simply assume that an ordinary artisan would be awakened to modify prior art in such a way as to lead to an obviousness rejection. It is in such circumstances, moreover, that it is especially important to guard against the dangers of hindsight bias.” *Plantronics*, at 18 (citation and internal quotation marks omitted).

*In re Kubin*, 561 F.3d 1351 (Fed. Cir. 2009), clarifies when “obvious to try” is “obviousness,” and when it is not.

The Supreme Court’s admonition against a formalistic approach to obviousness in this context actually resurrects this court’s own wisdom in *In re O’Farrell*, which predates the *Deuel* decision by some seven years. This court in *O’Farrell* cautioned that “obvious to try” is an incantation whose meaning is often misunderstood:

It is true that this court and its predecessors have repeatedly emphasized that “obvious to try” is not the standard under § 103. However, the meaning of this maxim is sometimes lost. Any invention that would in fact have been obvious under § 103 would also have been, in a sense, obvious to try. The question is: when is an invention that was obvious to try nevertheless nonobvious?

*In re O'Farrell*, 853 F.2d 894, 903 (Fed. Cir. 1988). To differentiate between proper and improper applications of “obvious to try,” this court outlined two classes of situations where “obvious to try” is erroneously equated with obviousness under § 103. In the first class of cases,

what would have been “obvious to try” would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful.

*Id.* In such circumstances, where a defendant merely throws metaphorical darts at a board filled with combinatorial prior art possibilities, courts should not succumb to hindsight claims of obviousness. The inverse of this proposition is succinctly encapsulated by the Supreme Court’s statement in *KSR* that where a skilled artisan merely pursues “known options” from a “finite number of identified, predictable solutions,” obviousness under § 103 arises. 550 U.S. at 421.

The second class of *O'Farrell*’s impermissible “obvious to try” situations occurs where

what was “obvious to try” was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it.

853 F.2d at 903. Again, *KSR* affirmed the logical inverse of this statement by stating that § 103 bars patentability unless “the improvement is more than the predictable use of prior art elements according to their established functions.” 550 U.S. at 417.

*In re Kubin*, 561 F.3d at 1359-60; accord *Leo Pharmaceutical Prod. v. Rea*, No. 2012-1520, slip op. at 17-18 (Fed. Cir. August 12, 2013); *Cyclobenzaprine*, 676 F.3d at 1070 (Fed. Cir. 2012) (“where the prior art, at best gives only general guidance as to the particular form of the claimed invention or how to achieve it, relying on an obvious-to-try theory to support an obviousness finding is impermissible”).

**Claims Rejection – 35 USC § 103(a)**

Claims 30-49 stand rejected as being obvious under 35 USC §103(a) in view of *Takigawa et al.*, (US Patent No. 6,207,071).

First, it should be recognized that the pending claims, in particular claim 30, recite “the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure.”

The Office Action comments in paragraph 5, page 3, “Applicant’s arguments regarding dew points and bubble points are not persuasive because they recite characteristics of combinations of tetrafluoroethane and pentafluoroethane which are obvious over the reference”, citing the PTO Board’s decision in the grandfather case. This, however, cannot be true as none of the claims pending before the Board in the grandfather case recited these features. None of the claims pending before the Board recited either the present feature of a dew point or a bubble point. Thus the Board could not have – and did not- render any form of a ruling concerning these presently recited features.

Additionally, there is no discussion, let alone teaching, of any kind in *Takigawa* concerning a dew point or a bubble point in regards to a refrigerant or selecting a blend of refrigerants, let alone a blend consisting of pentafluoroethane and tetrafluoroethane in regards to a dew point or a bubble point. Notably, the Office Action lacks any citation to anywhere in *Takigawa* where *Takigawa* presents any teaching or suggestion in regards to a dew point or a

bubble point for a refrigerant blend. Accordingly, the Office Action fails to present a *prima facie* case sufficient to support the rejection of the claims as obvious in view of Takigawa.

Moreover, there is no teaching or suggestion whatsoever in Takigawa that these features, namely the recited dew point and bubble point, are result-effective parameters. Nor does the Office stated why these are result-effective parameters. A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Only result-effective variables can be optimized. The Office has failed to describe why these features are result-effective variables as they are used in the claimed subject matter. Specifically, the Office has failed to state what the recognized result that is achieved. In addition, the Office does not provide any support for the assertion that these features are routinely optimized as is used in claim 30. Rather the Office makes a conclusory assertion that the amounts can be optimized without a reasonable argument to support its position. Thus, again the Office has not met its burden of providing a *prima facie* case of obviousness. Accordingly, the pending claims are novel and non-obvious over Takigawa.

Second, in response to the comment in paragraph 6, in particular the last sentence therein, questioning whether the 42:58 [sic] is really that different from the unsuitable 40:60 composition (note the claims that recite a ratio recite a ratio of 58% pentafluoroethane:42% tetrafluoroethane), the answer is yes.

One, the accepted guide for refrigerant designations is ASHRAE Standard 34. Based on assignment in prior editions and addenda thereto, Table 4-2 in ASHRAE 34 identifies two R-421-series blends (along with adopted safety data and classifications for them) as compositions of R-125 and R-134a with formulation and tolerances of:

a. R-421A: R-125/134a (58.0% / 42.0%) ( $\pm 1.0/\pm 1.0$ )

b. R-421B: R-125/134a (85.0% / 15.0%) ( $\pm 1.0/\pm 1.0$ )

As such, the composition of 60% R-125 / 40% 134a (60.0/40.0) is distinct from R-421A [58% R-125 / 42% 134a (58.0/42.0)] and does not fall within ASHRAE's formulation tolerances ( $\pm 1.0/\pm 1.0$ ). Stated another way, the 60.0/40.0 (or "60/40") composition cannot be identified as within ASHRAE's designation and tolerances for the R-421A of 58% R125 / 42% R134a . Were one to seek a standard designation for 60% R-125 / 40% 134a (60.0/40.0), it would be eligible for a separate ASHRAE designation, in accordance with ASHRAE 34 §4.4 and §4.4.1.

ASHRAE, 2013. *Designation and Safety Classification of Refrigerants*. ANSI/ASHRAE Standard 34-2013, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Atlanta, GA, USA

Two, the preceding point also is consistent with the applicable international standard, ISO Standard 817, which at this point is harmonized with regard to designations to ASHRAE 34 from which it is derived. The applicable ISO 817 sections are §3.4 and §3.4.1 (relocated to §4.4, §4.4.1, and §4.4.2 in a draft now pending balloting approval). While the current version of ISO 817 as approved lacks specific guidance on composition tolerances corresponding to ASHRAE 34 §4.4.2, the same stipulations are pending in §4.4.3 of a draft revision pending approval (balloting has completed but ISO has not yet published the outcome). Moreover, the blend tolerances included in ISO 817 Table 2 are consistent with those in ASHRAE 34 at corresponding publication dates.

ISO, 2005. *Refrigerants — Designation System*. ISO standard 817:2005(E), International Organization for Standardization (ISO), Geneva, Switzerland

ISO, 2008. *Refrigerants — Designation and Safety Classification*. ISO working document ISO/DIS 817:2008 (2008.02.01), International Organization for Standardization (ISO), Geneva, Switzerland.

ISO, 2009. *Refrigerants — Designation and Safety Classification*. ISO working document ISO/DIS 817:2009 (2010.03.24), International Organization for Standardization (ISO), Geneva, Switzerland.

ISO, 2013. *Refrigerants — Designation and Safety Classification*. ISO working document ISO/FDIS 817:2013(E) (balloting 2014.01.01-2014.03.08, but results not yet formally announced), International Organization for Standardization (ISO), Geneva, Switzerland.

Nearly all safety standards for refrigeration systems and the pertinent provisions of model codes, national and regional counterparts outside the USA, and regulations inside and outside the USA reference the ASHRAE 34 and/or ISO 817 standards for refrigerant designations and safety classifications. Accordingly, the comments addressing R-421 series (R-125/134a blends) distinctions are applicable on nearly a worldwide basis.

For example, ASHRAE 34 and ISO 817 designate multiple blends with the same components and similar formulations, for example:

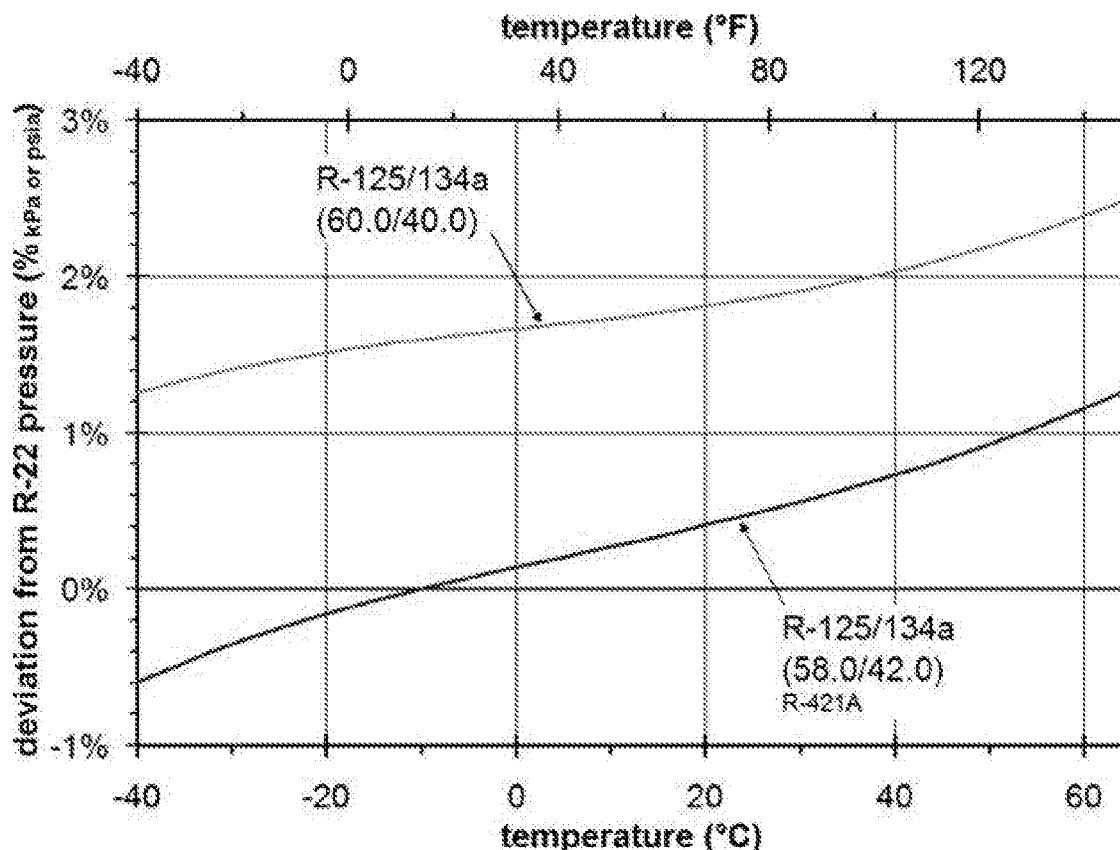
- c. 410A: R-32/125 (50.0/50.0) (+0.5, -1.5 / +1.5, -0.5), and  
410B: R-32/125 (45.0/55.0) ( $\pm 1.0/\pm 1.0$ )
- d. 433A: R-1270/290 (30.0/70.0) ( $\pm 1.0/\pm 1.0$ ), and  
433C: R-1270/290 (25.0/75.0) ( $\pm 1.0/\pm 1.0$ )
- e. 436A: R-290/600a (56.0/44.0) ( $\pm 1.0/\pm 1.0$ ), and  
436B: R-290/600a (52.0/48.0) ( $\pm 1.0/\pm 1.0$ )

The composition differences reflect separate customization or optimization strategies for their use as refrigerant compositions.

Three, manufacturers frequently tweak formulations, by amounts as small as 0.1% by mass (for example the difference between 50.0/50.0 and 50.1/49.9) in the course of product development and testing before commercialization. There have been several cases of application submissions to the cognizant project committee for ASHRAE 34, Standing Standard Project Committee (SSPC) 34, and therefore also ISO 817 in which data are provided for a formulation slightly different from that sought based on last minute formulation revisions. An example occurred with an application dated 2013.12.12 by DuPont Fluoroproducts for which portions of the application actually addressed R-32/125/134a/1234yf (24.0/25.0/26.0/25.0) based on the developmental version, which had already changed several times in the course of several years of development. Although nontrivial to do so, the applicant prepared and replaced the complete electronic and printed submission of 118 pages just six days later on 2013.12.19

to reflect the final formulation of R-32/125/134a/1234yf (24.3/24.7/25.7/25.3). The difference illustrates the importance of a seemingly small difference of just 0.3% by mass for each component.

Four, the following figure shows the difference in deviations from R-22 (chlorodifluoromethane), the most widely used refrigerant from the late 1950s until 2010 and that most commonly used in residential air conditioners among other applications. Many blends, including R-421A (58% R125 / 42% R134a), were developed for and are marketed as Freon – 22 (R-22) replacements with the phase-out of ozone-depleting substances, of which Freon – 22 (R-22) is one.



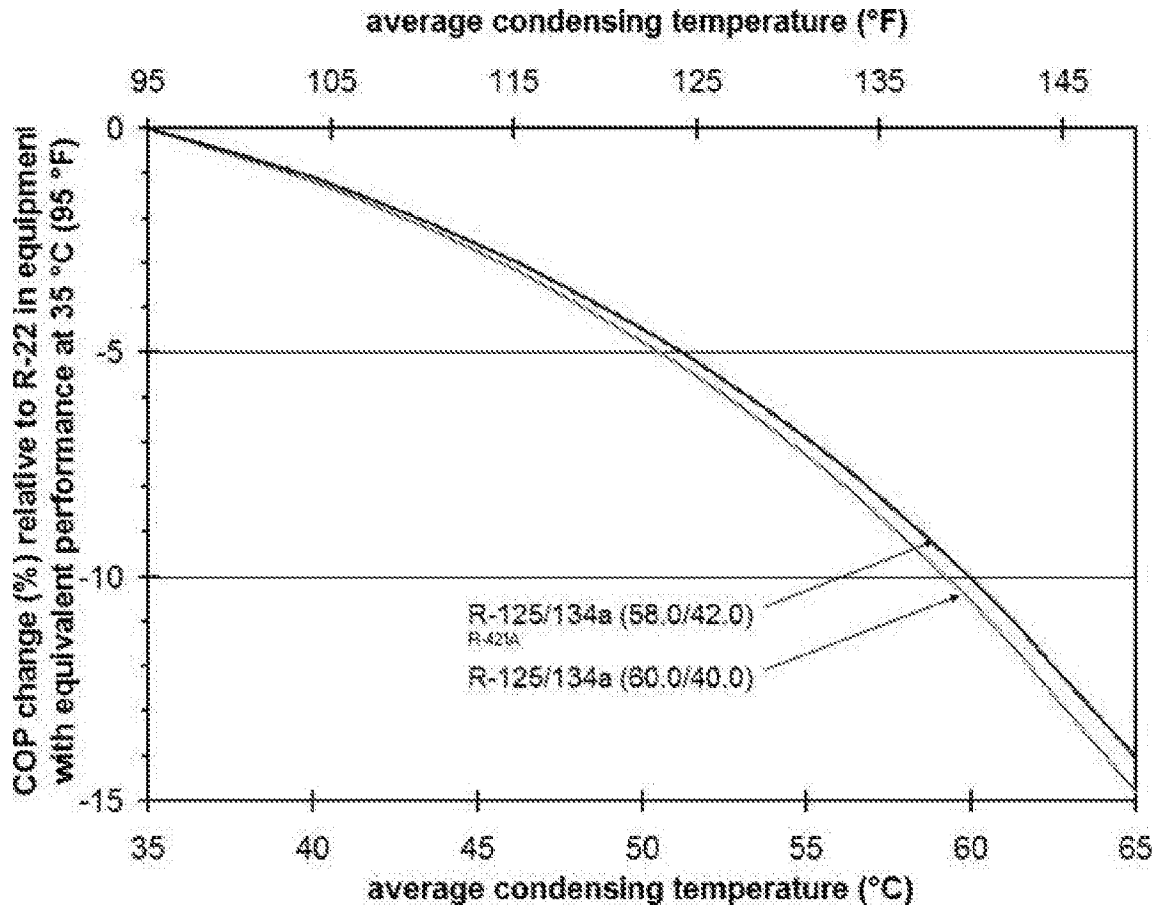
As shown in the above figure, R-421A [58% R-125 / 42% R-134a (58.0/42.0)] offers a much closer approximation of the thermodynamic R-22 pressure-temperature (P-T) characteristics than 60% R-125 / 42% R-134a (60.0/40.0), an important consideration for replacement of Freon – 22 (R22) and for retrofit and specifically for thermostatic expansion

valve control of refrigerant flow metering in air conditioning and refrigeration machinery. Over the temperature range of -40 to +65 °C (-40 to +149 °F), the pressure deviation in (kPa or psia) for R-421A [58% R-125 / 42% R134a (58.0/42.0)] compared to Freon -22 (R-22) deviates by -0.6 to +1.3% as contrasted to 1.3 to 2.5% for 60% R-125 / 42% R134a (60.0/40.0) with average deviations of 0.3% and 1.8%, respectively. Restated in terms of gauge pressure (psig), the corresponding ranges are -16.1 to 1.4% for and 33.9 to 2.6% with averages of -0.5 and 4.0%. In short, unexpectedly R-421A [58% R-125 / 42% R134a (58.0/42.0)] better approximates the pressure-temperature (P-T) characteristics of Freon (R-22) than 60% R-125 / 40% R134a (60.0/40.0).

For the evaporating temperature span of primary interest as a replacement for Freon – 22 (R-22) in air conditioning and refrigeration, namely -20 to +10 °C (-4 to +14), the average pressure deviation compared to Freon – 22 (R-22) on an absolute pressure basis for R-421A [58% R-125 / 42% R134a (58.0/42.0)] is approximately 5% that of 60% R-125 / 40% R134a (60.0/40.0).

Fifth, predicated on a representative average evaporating temperature of 10 °C (50 °F) without superheat, R-421A [58% R-125 / 42% R134a (58.0/42.0)] outperforms 60% R-125 / 40% R134a by 0.15 to 1.04% for average condensing temperatures spanning 35-65 °C (95-149 °F) without sub-cooling. The calculations are based on theoretical-cycle calculations discounting compressor and motor efficiency, fan power and similar parasitic losses and also assuming ideal heat transfer and fluid flow; these simplifications actually give a very slight advantage to the less-efficient refrigerant option. The following doubly-normalized figure shows the comparative performance losses with increasing condenser temperatures (when cooling is most needed) for such idealized cycles predicated on equipment modification to yield the same nominal COP for Freon – 22 (R-22) and the two substituted blends at the common rating condition of 35 °C (95 °F) condensing:





As shown, R-421A [58% R-125 / 42% R134a (58.0/42.0)] unexpectedly outperforms the 60% R-125 / 42% R134a (60.0/40.0) composition for the full range, but its advantage grows at higher temperatures, namely when air conditioning and refrigeration loads increase (when most needed). The higher temperatures also are when utility demand rates kick in when applicable (normally for commercial and industrial but not for residential rates). Stated another way, **unexpectedly the “58/42” [R-421A (58% R125 / 42% R134a)] composition benefits are greatest when most needed** as compared to the 60% R125 / 40% R134a composition.

Sixth, the lower fraction of R-125 (with five fluorine atoms per molecule compared to four in the R-134a component) for R-421A [58% R-125 / 42% R134a (58.0/42.0)] implies additional advantages compared to 60% R-125 / 40% R134a (60.0/40.0). First, the lower fluorination implies a slightly lower cost under rational pricing scenarios. Second, the Global Warming Potential (GWP), an indicator of potency as a greenhouse gas relative to carbon dioxide for 100

year integration (the value most often cited and used in treaties and regulations) for R-421A [58% R-125 / 42% R134a (58.0/42.0)] is 2380 compared to 2420 for 60% R-125 / 40% R134a (60.0/40.0); the 1.7% lower (more favorable) value is again due to the lower fraction of R-125 in R-421A [58% R125 / /42% R134a] as compared to 60% R125 / /40% R134a.

Thus, as shown above, the statement: "The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified" is not correct. As shown, the recited compositions do not have properties similar to those compositions which are exemplified in *Takigawa et al.*

Moreover, Applicant's recited refrigerant composition consisting of a blend of tetrafluoroethane and pentafluoroethane in a ratio exhibiting such dew point or bubble point does not cover everything which will perform the desired functions (namely, a refrigerant blend composition for use with or as a substitute or a replacement for R-22) regardless of its composition. To the contrary the recited composition of the pending claims having the stated ratio describes a very specific composition having a capacity and efficiency that most closely mimics R-22 refrigerant over a selected temperature range, whereas compositions exemplified by *Takigawa et al.* do not. And as previously presented, refrigerant compositions of 1) 40% R134a and 60% R125, and 2) 60% R134a and 40% R125 are considered unsuitable as substitutes or replacements for R-22 and do not have approval by EPA for use a substitutes or replacements for R-22 (see, Declaration of Kenneth M. Ponder, paragraph 12).

To further clarify these distinctions, particularly between the recited refrigerant compositions and a composition of 60% pentafluoroethane and 40% tetrafluoroethane, the claims have been amended to recite that pentafluoroethane is present in an amount less than 60% and tetrafluoroethane is present in an amount greater than 40% by weight of the combined weight of the pentafluoroethane and the tetrafluoroethane.

**CONCLUSION**

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed and that all pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

**THOMAS | HORSTEMEYER, LLP**

By: /Todd Deveau/  
**Todd Deveau**  
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<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875	Application or Docket Number <b>13/493,491</b>	Filing Date <b>06/11/2012</b>	<input type="checkbox"/> To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

**APPLICATION AS AMENDED – PART II**

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	03/24/2016	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X \$40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	X \$210 =	0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
						TOTAL ADD'L FEE

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SLIE  
/SHARONE MOORE/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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13/493,491

06/11/2012

Kenneth M. Ponder

821920-1032

1039

24504

7590

03/24/2014

THOMAS I HORSTEMEYER, LLP  
400 INTERSTATE NORTH PARKWAY SE  
SUITE 1500  
ATLANTA, GA 30339

EXAMINER

HARDEE, JOHN R

ART UNIT

PAPER NUMBER

1761

NOTIFICATION DATE

DELIVERY MODE

03/24/2014

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@tkhr.com  
kristen.layton@tkhr.com  
ozzie.liggins@tkhr.com

<b>Notice of Abandonment</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	13/493,491	PONDER ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	JOHN HARDEE	1761

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 09 September 2013.
  - (a) ☐ A reply was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply (including a total extension of time of \_\_\_\_\_ month(s)) which expired on \_\_\_\_\_.
  - (b) ☒ A proposed reply was received on 10 March 2013, but it does not constitute a proper reply under 37 CFR 1.113 to the final rejection.  
 (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
  - (c) ☐ A reply was received on \_\_\_\_\_ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
  - (d) ☐ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
  - (a) ☐ The issue fee and publication fee, if applicable, was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
  - (b) ☐ The submitted fee of \$\_\_\_\_\_ is insufficient. A balance of \$\_\_\_\_\_ is due.  
 The issue fee required by 37 CFR 1.18 is \$\_\_\_\_\_. The publication fee, if required by 37 CFR 1.18(d), is \$\_\_\_\_\_.
  - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
  - (a) ☐ Proposed corrected drawings were received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply.
  - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record or other party authorized under 37 CFR 1.33(b). See 37 CFR 1.138(b).
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on \_\_\_\_\_ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☐ The reason(s) below:

Applicant's RCE request was improper for the reasons given in the letter of 3/13/14.

	/JOHN HARDEE/ Primary Examiner, Art Unit 1761
--	--

Petitions to revive under 37 CFR 1.137, or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.




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24504 e 2014-03-13  
THOMAS | HORSTEMEYER, LLP  
400 INTERSTATE NORTH PARKWAY SE  
SUITE 1500  
ATLANTA, GA 30339

**Paper No.**

Application No.:	13/493,491 	Date Mailed:	2014-03-13
First Named Inventor:	Ponder, Kenneth, M.	Examiner:	HARDEE, JOHN R
Attorney Docket No.:	821920-1032	Art Unit:	1761
Confirmation No.:	1039	Filing Date:	2012-06-11

**Please find attached an Office communication concerning this application or proceeding.**

**Commissioner for Patents**

<b>NOTICE OF IMPROPER REQUEST FOR CONTINUED EXAMINATION (RCE)</b>	<b>Application No.</b> 13/493,491	<b>Applicant(s)</b> PONDER ET AL.	
		<b>Art Unit</b> 1700	<b>Date Mailed:</b>

The request for continued examination (RCE) under 37 CFR 1.114 filed on 10 March, 2014 is improper for reason(s) indicated below:

1. ☐ Continued examination under 37 CFR 1.114 does not apply to an application for a design patent. Applicant may wish to consider filing a continuing application under 37 CFR 1.53(b) or a CPA under 37 CFR 1.53(d). An RCE cannot be treated as a CPA.
2. ☐ Continued examination under 37 CFR 1.114 does not apply to an application that was filed before June 8, 1995. Applicant may wish to consider filing a continuing application under 37 CFR 1.53(b).
3. ☐ Continued examination under 37 CFR 1.114 does not apply to an application unless prosecution in the application is closed. If the RCE was accompanied by a reply to a non-final Office action, the reply will be entered and considered under 37 CFR 1.111. If the RCE was not accompanied by a reply, the time period set forth in the last Office action continues to run from the mailing date of that action.
4. ☐ The request was not filed before payment of the issue fee, and no petition under 37 CFR 1.313 was granted. If this application has not yet issued as a patent, applicant may wish to consider filing either a petition under 37 CFR 1.313 to withdraw this application from issue, or a continuing application under 37 CFR 1.53(b).
5. ☐ The request was not filed before abandonment of the application. The application was abandoned, or proceedings terminated on \_\_\_\_\_. Applicant may wish to consider filing a petition under 37 CFR 1.137 to revive this abandoned application.
6. ☐ The request was not accompanied by the fee set forth in 37 CFR 1.17(e) as required by 37 CFR 1.114. Since the application is not under appeal, the time period set forth in the final Office action or notice of allowance continues to run from the mailing date of that action or notice.
7. ☒ The request was not accompanied by a submission as required by 37 CFR 1.114. Since the application is not under appeal, the time period set forth in the final Office action or notice of allowance continues to run from the mailing date of that action or notice.

**Note:** A continued prosecution application (CPA) under 37 CFR 1.53(d) cannot be filed in a utility or plant application. A CPA filed in a utility or plant application that has a filing date **on or after June 8, 1995** will be treated as an RCE under 37 CFR 1.114. The request for a CPA in the instant application, however, has been treated as an improper RCE for the reason(s) indicated above.

***A copy of this Notice MUST be returned with the reply.***

Direct any questions concerning this notice to

/CRYSTAL QUEEN/, Technology Center 1700

Telephone Number: (571)272-1041



## REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL (Submitted Only via EFS-Web)

Application Number	13/493,491	Filing Date	2012-06-11	Docket Number (if applicable)	821920-1032	Art Unit	1761
First Named Inventor	Kenneth M. Ponder			Examiner Name	Hardee, John R.		

**This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.**

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

### SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on \_\_\_\_\_

☐ Other \_\_\_\_\_

☒ Enclosed

☐ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☒ Other

Petition for 3-months EOT

### MISCELLANEOUS

☒ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months 3  
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other \_\_\_\_\_

### FEES

**The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 200778

### SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

Signature of Registered U.S. Patent Practitioner			
Signature	/Todd Deveau/	Date (YYYY-MM-DD)	2014-03-10
Name	Todd Deveau	Registration Number	29526

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>		Docket Number (Optional) <b>821920-1032</b>
Application Number <b>13/493,491</b>	Filed <b>June 11, 2012</b>	
For <b>REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT</b>		
Art Unit <b>1761</b>	Examiner <b>Hardee, John R.</b>	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ _____
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ _____
<input checked="" type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ <b>700</b>
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____

☐ Applicant asserts small entity status. See 37 CFR 1.27.☐ Applicant certifies micro entity status. See 37 CFR 1.29.  
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.☐ A check in the amount of the fee is enclosed.☒ Payment by credit card. Form PTO-2038 is attached.☐ The Director has already been authorized to charge fees in this application to a Deposit Account.☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to  
Deposit Account Number 20-0778.☒ Payment made via EFS-Web.**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant.☒ attorney or agent of record. Registration number 29,526.☐ attorney or agent acting under 37 CFR 1.34. Registration number \_\_\_\_\_./Todd Deveau/

Signature

March 10, 2014

Date

Todd Deveau

Typed or printed name

770-933-9500

Telephone Number

**NOTE:** This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below\*.☐ \* Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	13493491			
<b>Filing Date:</b>	11-Jun-2012			
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder			
<b>Filer:</b>	Todd Deveau./Amy Kwon			
<b>Attorney Docket Number:</b>	821920-1032			
Filed as Small Entity				
<b>Utility under 35 USC 111(a) Filing Fees</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				
Extension 8 months with \$0 paid				
Case 9:20-cv-00142-FL	Document 153-8	Filed 06/04/21	Page 298 of 383	257 <sup>700</sup>

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Miscellaneous:</b>				
Request for Continued Examination	2801	1	600	600
<b>Total in USD (\$)</b>				<b>1300</b>

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	18415504
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau./Amy Kwon
<b>Filer Authorized By:</b>	Todd Deveau.
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	10-MAR-2014
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	12:28:30
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 1300
RAM confirmation Number	12209
Deposit Account	
Authorized User	

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part (if appl.)	Pages (if appl.)
Case 9:20-cv-00142-PL	Document 158-8	filed 06/04/21	Page 260 of 383	259	



1	Request for Continued Examination (RCE)	01985856.PDF	697830 be43d397faa6db8fdd0c0fb066d51d135be618d	no	3
<b>Warnings:</b>					
<b>Information:</b>					
2	Extension of Time	01985858.PDF	151540 2dd4737bba387daf0db2ed0032112337fcea9a830	no	2
<b>Warnings:</b>					
<b>Information:</b>					
3	Fee Worksheet (SB06)	fee-info.pdf	32312 61851c50d72cad1c77eb97a5c6f19bba7dd16133	no	2
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			881682		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  <b>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</b></p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  <b>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</b></p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  <b>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</b></p>					



# UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office  
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032	1039
24504 7590 09/09/2013 THOMAS I HORSTEMEYER, LLP 400 INTERSTATE NORTH PARKWAY SE SUITE 1500 ATLANTA, GA 30339			EXAMINER HARDEE, JOHN R	
			ART UNIT 1761	PAPER NUMBER
			NOTIFICATION DATE 09/09/2013	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@tkhr.com  
kristen.layton@tkhr.com  
ozzie.liggins@tkhr.com

<b>Office Action Summary</b>	<b>Application No.</b> 13/493,491	<b>Applicant(s)</b> PONDER ET AL.	
	<b>Examiner</b> JOHN HARDEE	<b>Art Unit</b> 1761	<b>AIA (First Inventor to File) Status</b> No

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 8/26/13.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 5) ☒ Claim(s) 30-49 is/are pending in the application.  
5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 30-49 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

\* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

#### Certified copies:

- a) ☐ All    b) ☐ Some \*    c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 3) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 4) <input type="checkbox"/> Other: ____.  |

1. The present application is being examined under the pre-AIA first to invent provisions.

### **DETAILED ACTION**

2. Applicant's arguments regarding the rejection under 112 are persuasive, and the rejection is withdrawn. However, applicant takes on the burden of showing that prior art compositions do not meet the recited limitations.

### ***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 30-49 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Takigawa et al., US 6,207,071 for the reasons of record in the previous office action. Newly added claims 47-49 recite physical characteristics of compositions which are obvious over the reference.

### ***Response to Arguments***

5. Applicant's arguments filed August 26, 2013 have been fully considered but they are not persuasive. Applicant argues that the Takigawa reference does not present any teaching or suggestion of a refrigerant composition as recited in claims 30 and 32. This is not persuasive because Takigawa discloses the desirability of replacing chlorofluorocarbons at col. 1, lines 20+. Furthermore, chlorodifluoromethane, or R22, is notoriously well known in the art for its ozone depletion and global warming properties.

At col. 8, lines 64+, the reference discloses a variety of heat transfer apparatus in which the disclosed refrigerant compositions are useful, with no teaching that any alteration would be required. Applicant's arguments regarding dew points and bubble points are not persuasive because they recite characteristics of combinations of tetrafluoroethane and pentafluoroethane which are obvious over the reference. See the PTO Board of Patent Appeals and Interferences decision in the grandfather case, 10/937,736.

6. The declaration of Mr. Kenneth Ponder has been carefully considered, but it is also found not to be persuasive. Paragraphs 1-8 are drawn to the background of the invention. At paragraph 9, Mr. Ponder states that he does not find any mention or suggestion in the Takigawa reference of compositions including refrigerant gases consisting of tetrafluoroethane and pentafluoroethane which provides the superior properties described earlier in the declaration. This is not persuasive because the examiner and his superiors at the Board found motivation in the reference to make such compositions, as noted above. Regarding paragraph 10, while the claims in the grandparent case did not recite apparatus suitable for R22, the reference provides motivation for replacement of hydrochlorofluorocarbons with the disclosed hydrofluorocarbon blends, and it teaches their utility in a variety of heat transfer apparatus. Regarding the arguments of paragraph 11, the Takigawa reference does not disclose the use of any and all combinations of tetrafluoroethane and pentafluoroethane. In paragraph 12, Mr. Ponder argues that not all compositions consisting of 40-60% of each of tetrafluoroethane and pentafluoroethane are suitable as R22 replacements, citing three examples. Do these compositions meet the bubble and

dew point limitations of the broad claims? There is nothing of record that says they do not. In addition, determination of which compositions within the relatively narrow range of 40-60% of each of tetrafluoroethane and pentafluoroethane are suitable for any given application amounts to ordinary experimentation. Is there *evidence on record* that the three examples mentioned in this paragraph were found unsuitable as R22 replacements? Why were they unsuitable? Is the recited 42:58 composition really that different from the unsuitable 40:60 composition?

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, Dr. John R. Hardee, whose telephone number is (571) 272-1318. The examiner can normally be reached on Monday through Friday from 8:00 until 4:30. In the event that the examiner is not available, his supervisor, Mr. Harold Pyon, may be reached at (571) 272-1498.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/John R. Hardee/  
Primary Examiner  
August 28, 2013

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application of:	Confirmation No.: 1039
Ponder et al.	Group Art Unit: 1761
Serial No.: 13/493,491	Examiner: Hardee, John R.
Filed: June 11, 2012	Docket No. 821920-1032
For: <b>REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT</b>	

**RESPONSE TO NON-FINAL OFFICE ACTION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

The Non-final Office Action from Examiner John R. Hardee mailed on March 25, 2013 (Paper No./Mail Date 20130319), has been received and reviewed. Applicant provides the following amendments and remarks in response.

**AUTHORIZATION TO DEBIT ACCOUNT**

A petition for a 2-months extension of time is herein submitted. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefore (including fees for net addition of claims) are hereby authorized to be charged to deposit account no. 20-0778.



**IN THE CLAIMS:**

Please amend the claims as indicated hereafter wherein the changes are shown by strikethrough or double brackets for deleted matter and underlining for added matter.

1 – 29. (Cancelled)

30. (Currently Amended) In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethanes wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

31. (Currently Amended) In the apparatus of claim 30, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

32. (Currently Amended) A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute refrigerant composition designed to achieve a phase change and comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure,

(2) supplying a the substitute refrigerant composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

(3) adding to said apparatus via the manifold the substitute refrigerant composition for chlorodifluoromethane, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

33. (Currently Amended) The method of claim 32, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

34. (Currently Amended) A refrigerant composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, wherein the refrigerant composition further comprises non-refrigerant

gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

35. (Currently Amended) The refrigerant composition of claim 34, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

36. (Previously presented) The refrigerant composition according to claim 34, wherein the lubricating oil includes an additive selected from the group consisting of further includes an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

37. (Previously presented) In the apparatus of claim 30, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

38. (Previously presented) In the apparatus of claim 30, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

39. (Previously presented) The method according to claim 32, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

40. (Previously presented) The method according to claim 32, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibit, a surfactant, a foaming agent, and mixtures thereof.
41. (Previously presented) In the apparatus of claim 30, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
42. (Previously presented) The method of claim 32, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
43. (Previously presented) The refrigerant composition of claim 34, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
44. (Previously presented) In the apparatus of claim 41, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.
45. (Previously presented) The method according to claim 42, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.
46. (Previously presented) The refrigerant composition according to claim 43, wherein said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

47. (New) In the apparatus of claim 30, wherein the blend exhibits a glide at about 9.5°F.
48. (New) The method of claim 32, wherein the blend exhibits a glide at about 9.5°F.
49. (New) The refrigerant composition of claim 34, wherein the blend exhibits a glide at about 9.5°F.

### **REMARKS**

The Office Action presents following points: 1) claims 30-43 stand rejected under 35 USC 112, second paragraph, as being indefinite; and 2) claims 30-46 stand rejected under 35 USC 103(a) as obvious in view of US 6,207,071 (*Takigawa et al.*).

Applicant respectfully requests reconsideration and withdrawal of the rejections based upon the amendment and remarks presented herein. This response is supported by the Declaration of Kenneth M. Ponder submitted herewith.

#### **1. Claim Rejections – 35 USC § 112**

Claims 30-43, but not claims 44-46, are rejected under 35 USC 112, second paragraph, as being indefinite, in particular for “merely setting forth physical characteristics desired in an article, and not setting forth specific compositions which would meet such a characteristics”, citing *Ex Parte Slob*, 157 USPQ 172 (Bd. Pat. App. & Int. 1967). (copy attached)

A reading of *Ex Parte Slob* shows that it does not support the rejection. In fact a reading *Ex Parte Slob* shows that this rejection is improper and should be withdrawn. In *Ex Parte Slob*, the Board of Patent Appeals and Interferences held that claim 16 which merely recited: “A process...which comprises thoroughly mixing together a powdered detergent composition and from about 2% to about 40% by weight of the powdered detergent composition of a liquefiable substance having a liquefaction (sic) temperature from about 40°C...” was properly rejected as being indefinite and too broad, and in particular for not setting forth specific compositions which would meet the characteristics recited in the claim. In contrast, however, the Board specifically held that the rejection of claim 26 would not be sustained where claim 26 recited a hydrated inorganic salt, specifically “hydrated sodium perborate”. The Board held that claim 26 “is clearly not too broad and indefinite”. Accordingly, the rejection of claim 26 was reversed.

The claims presented herein are analogous to claim 26 in *Ex Parte Slob* in that all the claims originally filed with this application and now presently pending particularly point out and

distinctly claim “refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane”, in contrast to claim 16 of *Ex Parte Slob* that vaguely recited “a liquefiable substance”. Accordingly, under the holding by the Board in *Ex Parte Slob*, the rejection of the present claims is not sustainable and should be withdrawn.

2. Claim Rejection – 35 USC § 103(a)

Claims 30-46 are rejected as being obvious under 35 USC §103(a) in view of *Takigawa et al.*, (US Patent No. 6,207,071).

This rejection relies upon the statement: “The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified, absent a showing to the contrary.” This statement, however, is not correct. As shown below, the recited compositions do not have properties similar to those compositions which are exemplified in *Takigawa et al.*

To the contrary, *Takigawa et al.* present no teaching or suggestion whatsoever of a refrigerant composition designed for use with chlorodifluoromethane refrigerant (R-22) or as a substitute or a replacement for R-22 refrigerant, as recited in independent claims 30, 32. Further, *Takigawa et al.* do not provide any teaching or suggestion whatsoever as to selecting such a refrigerant composition consisting of a blend of tetrafluoroethane and pentafluoroethane wherein the blend is selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, as recited in independent claims 30, 32 and 34.

Moreover, Applicant’s recited refrigerant composition consisting of a blend of tetrafluoroethane and pentafluoroethane in a ratio exhibiting such dew point or bubble point does not cover everything which will perform the desired functions (namely, a refrigerant blend composition for use with or as a substitute or a replacement for R-22) regardless of its composition. To the contrary the recited composition of the pending claims having the stated ratio describes a

very specific composition having a capacity and efficiency that most closely mimics R-22 refrigerant over a selected temperature range, whereas compositions exemplified by *Takigawa et al.* do not and would not be suitable for use with or as a substitute or a replacement for R-22 refrigerant. For example, refrigerant compositions of 1) 40% R134a and 60% R125, and 2) 60% R134a and 40% R125, noted in the Office Action, are considered unsuitable as substitutes or replacements for R-22 and do not have approval by EPA for use as substitutes or replacements for R-22 (see, Declaration of Kenneth M. Ponder, paragraph 12).

*Takigawa et al.* disclose: “A refrigerator oil for use with an HFC refrigerant containing HFC – 134a and/or HFC – 125”, which comprises a specific alkylbenzene oil. See abstract. In particular: “The object of the present invention [Takigawa et al.] is to provide a refrigerator oil to be used within HFC refrigerant containing HFC -134a and/or HFC – 125, which enables a refrigerating compressor to be prevented from its seizure, is excellent in lubricity and retains high reliability for a long period of time”. (emphasis added) See column 2, lines 14-18.

It is unquestionable that the objective of *Takigawa et al.* is to provide a refrigerator oil used with an HFC refrigerant containing HFC – 134a and/or HFC -125 in just about any composition, further stating that there is no restriction as to the kind of HFC to be mixed therewith. Thus, *Takigawa et al.* is focused on what type of refrigerator oil may be used with such a wide range of refrigerants and refrigerant compositions to prevent seizure. *Takigawa et al.* provide no teaching whatsoever as to what of those refrigerant compositions may be suitable as a substitute or replacement for refrigerant R-22 (chlorodifluoromethane), let alone how to determine what of those refrigerant compositions may be suitable as a substitute or replacement for R-22. *Takigawa et al.* make no distinction as to what if any of their refrigerant compositions would be suitable as an R-22 replacement or substitute. In fact, there can be no doubt, that *Takigawa et al.* disclose HFC refrigerant compounds or compositions that are unsuitable with or as a substitute or a replacement for R-22 (see, Declaration of Kenneth M. Ponder, paragraphs 11, 12).



Stated another way, *Takigawa et al.* fail to recognize the problem of finding a refrigerant composition that may be used with or as a substitute for R-22 refrigerant, let alone any possible solution to this problem addressed by Applicant. The failure of *Takigawa et al.* to recognize this problem, let alone teach a solution to this problem demonstrates the non-obviousness of Applicants' claimed solution in view of *Takigawa et al.*

In contrast, the presently pending claims, in particular independent claims 30 and 32, are directed to a refrigerant composition comprising a combination of "refrigerant gases consisting of blend of tetrafluoroethane and pentafluoroethane" that is suitable as for use with or as a substitute for chlorodifluoromethane (R-22). More particularly, the pending independent claims recite that the ratio of the tetrafluoroethane to the pentafluoroethane is selected such that the blend exhibits a dew point of about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure. This is a specific recitation that is not met by just any combination of tetrafluoroethane and pentafluoroethane. (See, Declaration of Kenneth M. Ponder, paragraph 8).

*Takigawa et al.* provide no teaching or suggestion, whatsoever, to a blend of refrigerant gases "consisting of" tetrafluoroethane and pentafluoroethane that exhibits such a dew point or bubble point. This is so because *Takigawa et al.* have no interest in identifying a specific blend or ratio of tetrafluoroethane and pentafluoroethane to be used with or as a substitute or a replacement for R-22 to the exclusion of other blends or ratios of tetrafluoroethane and pentafluoroethane. (see again, Declaration of Kenneth M. Ponder).

With respect to dependent claims 31, 33 and 35, there is no teaching or suggestion in *Takigawa et al.* to a combination "consisting of a blend of tetrafluoroethane and pentafluoroethane" wherein the blend of the two refrigerant components exhibits both a dew point at about -32°F and a bubble point at about -41.5°F at about one standard atmosphere of pressure.

With respect to independent claim 32 which is a method claim and its dependent claims 33, 39-40 and 42, Applicant respectfully submits *Takigawa et al.* fail to render these claims obvious. There is no teaching or suggestion in *Takigawa et al.* to a method for refilling an apparatus designed for use with chlorodifluoromethane refrigerant (R-22) that involves selecting a substitute refrigerant composition for R-22, the refrigerant gases “consisting of” a blend of tetrafluoroethane and pentafluoroethane, the ratio of tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F at about one standard atmosphere of pressure, further supplying the selected substitute refrigerant composition under pressure in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold for the apparatus and adding to the apparatus via the manifold the selected substitute the refrigerant composition recited therein as a substitute for R-22.

**CONCLUSION**

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed and that all pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

**THOMAS, KAYDEN, HORSTEMEYER  
& RISLEY, LLP**

By: /Todd Deveau/  
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1 of 1 DOCUMENT

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Ex parte SLOB

No Number in Original

U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences

157 U.S.P.Q. (BNA) 172

Patent issued Jan. 30, 1968    Opinion dated Apr. 13, 1967

**CASE HISTORY and DISPOSITION:** Appeal from Group 150.

Application for patent of Arie Willem Slob, Serial No. 194,658, filed May 14, 1962. From decision rejecting claims 16 to 28, applicant appeals (Appeal No. 625-73). Affirmed as to claims 16 to 25, 27, and 28; reversed as to claim 26.

**HEADNOTES:**  
**PATENTS**

[\*\*1H] 1. Claims -- Indefinite -- In general (20.551)

Claims merely setting forth physical characteristics desired in article, and not setting forth specific compositions which would meet such characteristics, are invalid as vague, indefinite, and functional since they cover any conceivable combination of ingredients either presently existing or which might be discovered in future and which would impart desired characteristics; thus, expression "a liquefiable substance having a liquefaction temperature from about 40 degreesC. to about 300 degreesC. and being compatible with the ingredients in the powdered detergent composition" is too broad and indefinite since it purports to cover everything which will perform the desired functions regardless of its composition, and, in effect, recites compounds by what it is desired that they do rather than what they are; expression also is too broad since it appears to read upon materials that could not possibly be used to accomplish purposes intended.--*Ex parte Slob (PO BdApp) 157 USPQ 172.*

Particular patents--Detergent Tablets

3,366,570, Slob, Process of Preparing Detergent Tablets, claim 26 of application allowed; claims 16 to 25, 27, and 28 refused.--*Ex parte Slob (PO BdApp) 157 USPQ 172.*

**CLASS-NO:** 20.551

**COUNSEL:** BRUMBAUGH, FREE, GRAVES & DONOHUE, New York, N.Y., for applicant.

**JUDGES:** Before LIDOFF, Examiner in Chief, and STONE and REBOLD, Acting Examiners in Chief.

**OPINIONBY:** STONE, Acting Examiner in Chief.

**OPINION:**

This is an appeal from the final rejection of claims 16 through 28, which are all the claims remaining in the application.

Claim 16 is illustrative:

16. A process for the preparation of a strong, hard surface, rapidly disintegrating and dissolving detergent tablet which comprises thoroughly mixing together a powdered detergent composition and from about 2% to about 40% by weight of the powdered detergent composition of a liquefiable substance having a liquefaction (sic) temperature from about 40 degreesC. to about 300 degreesC. and being compatible with the ingredients in the powdered detergent composition, forming the resulting mixture having the compatible liquefiable substance uniformly distributed therethrough into the shape of a tablet, heating the tablet-shaped mixture at a temperature from about 40 degreesC. to about 300 degreesC. for from about 90 seconds to about 6 minutes to liquefy thereby at least the portion of the liquefiable substance at the surface of the tablet-shaped mixture without completely melting the powdered detergent composition, and cooling the tablet-shaped mixture to [\*173] convert the liquefied liquefiable substance to solid state and thereby bind together at least the portion of the powdered detergent composition at the surface of the tablet-shaped mixture, whereby there is formed a strong detergent tablet which disintegrates and dissolves in water in about 15 to 75 seconds and which has a hard agglomerated surface portion and a center portion having a consistency in the range from hard agglomerates to loose powder.

No references are relied on.

The claims stand rejected as being indefinite and too broad, under 35 U.S.C. 112. The examiner has set forth a number of different expressions which he considers as being too broad and indefinite.

Go to Headnotes [\*1R] [1] We are in accord with the examiner's position with respect to the expression "a liquefiable substance having a liquefaction temperature from about 40 degreesC. to about 300 degreesC. and being compatible with the ingredients in the powdered detergent composition." In our opinion, this language purports to cover everything which will perform the desired functions regardless of its composition, and, in effect, recites the compounds by what it is desired that they do rather than what they are. We consider the holding in *Austen Laboratories, Inc. v. Nobilium Processing Company*, 115 USPQ 44, is especially pertinent here, that claims merely setting forth physical characteristics desired in an article, and not setting forth specific compositions which would meet such characteristics, are invalid as vague, indefinite, and functional since they cover any conceivable combination of ingredients either presently existing or which might be discovered in the future and which would impart the desired characteristics. The decision relied upon the Supreme Court decision of *Holland Furniture Co. v. Perkins Glue Co.*, 1928 C.D. 266, 372 O.G. 517, 275 U.S. 512. See also *General Electric Co. v. Wabash Appliance Corp.*, 1938 C.D. 813, 491 O.G. 463, 304 U.S. 364, 37 USPQ 466; and *In re Fullam et al.*, 34 CCPA 1018, 1947 C.D. 352, 603 O.G. 189, 161 F.2d 247, 73 USPQ 399.

We also find the expression too broad as it appears to read upon materials that could not possibly be used with a powdered detergent composition to accomplish the purposes intended. For example, the language is broad enough to read upon Wood's metal and Wood's alloy which have a melting point of approximately 71 degreesC. Such materials melt within the temperature range recited and are compatible with the detergent composition but clearly will not give rise to a suitable preparation for detergent or laundry purposes.

The examiner has also set forth a number of examples of different compounds which decompose when heated within the range claimed and which could not be used for the purposes intended. On the basis of the limited disclosure of approximately ten ingredients, most of which are hydrated inorganic salts, we see no reason for the allowance of claims drawn to all substances which are totally unrelated to those ingredients shown as suitable by appellant and which are merely claimed by the designation of desired properties.

We are also in accord with the examiner's position with respect to the expression "a hydrated inorganic salt," as recited in claim 25, as this reads on such a salt as strontium dichromate .3H[2] O which the examiner has indicated decomposes within the temperature range recited and which would be unsuitable for the purpose in view. This expression also reads

upon sodium dichromate .2H<sub>2</sub>O which melts at 100 degreesC. and which would clearly be unsuitable for washing purposes in view of its color.

We do not agree with the examiner's position with regard to the expression "a powdered detergent composition," per se, or his objections to "forming the product into the shape of a tablet."

We will not sustain the rejection as to claim 26 wherein the hydrated inorganic salt is the specific compound, hydrated sodium perborate. There is no reference to show the combination recited in this claim and the claim is clearly not too broad and indefinite.

The decision of the examiner is affirmed as to claims 16 through 25, 27, and 28 but is reversed as to claim 26.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application of:

Confirmation No.: 1039

Ponder et al.

Group Art Unit: 1761

Serial No.: 13/493,491

Examiner: Hardee, John R.

Filed: June 11, 2012

Docket No. 821920-1032

For: **REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22  
REFRIGERANT**

**DECLARATION OF KENNETH M. PONDER**

I, Kenneth M. Ponder, hereby declare as follows:

1. I am the President of RMS of Georgia, LLC and am a co-inventor named on the above application.
2. RMS of Georgia, LLC sells and distributes refrigerants and reclaims most refrigerants.
3. Among the refrigerants that RMS of Georgia, LLC sells and distributes are refrigerants known under ASHRAE designations R-421A and R-421B. Our R-421A and R-421B refrigerants are approved by ASHRAE and are SNAP approved by the U.S. Environmental Protection Agency (EPA) for use with or as a replacement or substitute for R-22 refrigerant for different uses, as described below. The refrigerant having the ASHRAE designation R-421A is a refrigerant composition that is a mixture of R-125(pentafluoroethane) and R-134a (1,1,1,2-tetrafluoroethane) blended with a lubricant in which R-125 is present in an amount of about 58% by weight and R-134a is present in an amount of about 42% by weight of the two refrigerant gases. R-421B, on the other hand, is also a mixture of R-125 (pentafluoroethane) and R-134a (1,1,1,2-tetrafluoroethane). R-421B, however, includes pentafluoroethane in the amount of about

85% by weight and 1,1,1, 2-tetrafluoroethane in the amount of about 15% by weight of the two refrigerant gases.

4. Our R-421B refrigerant comprised of about 85% by weight pentafluoroethane and about 15% tetrafluoroethane by weight of the refrigerant gases is covered by U.S. Patent No. 7,320,763 on which I am named as a co-inventor.

5. Our R-421A refrigerant was developed for use with or as a replacement or a substitute for R-22 refrigerant that consists of chlorodifluoromethane. R-22 refrigerant could cover a wide array of temperatures. The industry has not yet found a single refrigerant composition that could replace R-22 for use over the entire array of temperatures over which R-22 was used. As a result, the industry has had to come up with multiple refrigerant compositions covering different arrays of temperatures.

6. Our R-421A and our R-421B refrigerants were developed to address different uses in the marketplace. In particular, R-421A was developed to address a higher temperature or (medium temp) application in the industry. By high or medium temperature applications I mean approximately -5°F to +45 °F. In contrast, R-421B was developed as a long term option for low temperature applications in the industry. By low temperature applications, I mean applications below about 0°F and generally in the range of below about -5°F to about -40°F. Accordingly, R-421A and R-421B are marketed by us and used by our customers for different applications to meet different needs, depending upon whether a high R-22 and medium R-22 temperature application or a low R-22 temperature application is the specified use by our customer.

7. Our refrigerant R-421A that consists of 58% pentafluoroethane and 42% tetrafluoroethane, which would be covered by the presently pending claims in this application, is superior to R-421B that consists of 85% pentafluoroethane and 15% tetrafluoroethane in high and medium temperature applications because it has a different temperature-pressure profile than R-421B and because the temperature-pressure profile



of R-421A is superior to that of R-421B for high and medium temperature applications.

8. As noted in my above application, one way of exemplifying such a refrigerant gas composition that consists of pentafluoroethane and tetrafluoroethane for use with or as a replacement for R-22 refrigerant for high and medium temperature applications is by specifying a dew point at about -32°F or a bubble point at about -41.5°F or both for the refrigerant composition blend. This is a specific recitation that is not met by just any combination of tetrafluoroethane and pentafluoroethane. Table 2 in my above application is a temperature/pressure chart that presents the bubble point or boiling point for the various compositions for given temperatures and pressures. As can be seen a bubble point of about -41.5°F for the (58-42) composition is at about 14.7 psi, or at about one standard atmosphere of pressure. The “glide” is simply the difference between the bubble point temperature and the dew point temperature for a given composition at the same pressure.

9. I have read U.S. Patent No. 6,207,071 (Takigawa) and do not find any mention or suggestion in Takigawa of combining pentafluoroethane with tetrafluoroethane to create a composition including refrigerant gases consisting of pentafluoroethane and tetrafluoroethane to the exclusion of other refrigerant gases except for impurities ordinarily associated with those two gases having a temperature-pressure profile that provides superior properties for use in high and medium temperature applications as described above.

10. I also do not find any mention or suggestion in Takigawa for how to determine what HFC refrigerant or combination of HFC refrigerants would be suitable to be used with or as a substitute or a replacement for R-22 (chlorodifluoromethane). Not all HFC refrigerants are suitable for use with or as a substitute or a replacement for R-22.

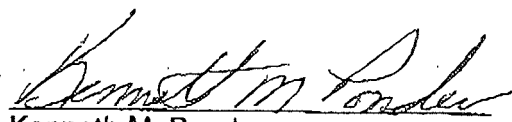
11. Not all combinations of HFC-125 (pentafluoroethane) and HFC-134a (1,1,1,2-tetrafluoroethane) are suitable for use with or as a substitute or a replacement for R-22. In fact the only combination of HFC-125 and HFC-134a to the exclusion of other refrigerant gases that are SNAP approved by EPA to be suitable for use with or as a substitute or replacement for R-22 are our R-421A and R-421B refrigerants.

12. I understand the Office Action mailed March 25, 2013 takes the position that Takigawa teaches to one skilled in the refrigerant art a refrigerant composition consisting of 40-60% R134a and 60-40% R125 to the exclusion of any other refrigerant gas. I respectfully disagree. Even assuming this position is correct, this covers a wide range of combinations of R134a and R125 that are not suitable for use with or as a substitute or a replacement for R-22. As examples, refrigerant compositions of 1) 40% R134a and 60% R125, 2) 60% R134a and 40% R125, and 3) 50% R134a and 50% R125 are considered unsuitable as substitutes or replacements for R-22, and do not have approval, by EPA or ASHRAE for use with or as a substitute or replacement for R-22.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of this patent.

Respectfully submitted,

Date: August 26, 2013

  
Kenneth M. Ponder

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	13493491			
<b>Filing Date:</b>	11-Jun-2012			
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder			
<b>Filer:</b>	Todd Deveau./Amy Kwon			
<b>Attorney Docket Number:</b>	821920-1032			
Filed as Small Entity				
<b>Utility under 35 USC 111(a) Filing Fees</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				
Extension 2 months with fee paid				

Case 9:20-cv-00142-FL Document 153-8 Filed 06/04/21 Page 287 of 383

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Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>300</b>

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	16683979
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau./Amy Kwon
<b>Filer Authorized By:</b>	Todd Deveau.
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	26-AUG-2013
<b>Filing Date:</b>	11-JUN-2012
<b>Time Stamp:</b>	14:26:03
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 300
RAM confirmation Number	766
Deposit Account	
Authorized User	

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part (if appl.)	Pages (if appl.)
Case 9:20-cv-00142-PLE Document 150-8		06/04/21	Page 289 of 383	288	288

1	Extension of Time	01875548.PDF	151534	no	2
			48ed92d17a8f31294e1acf595e1dcb6d00b0f94c		
Warnings:					
Information:					
2	Amendment/Req. Reconsideration-After Non-Final Reject	01891171.PDF	133874	no	12
			d9bfbaa649ce16bda5ac8120e2b432acc6d23345		
Warnings:					
Information:					
3	Miscellaneous Incoming Letter	01875796.PDF	142391	no	3
			a72deaf4f59cbda26819f975ba03a13db19471b4		
Warnings:					
Information:					
4	Miscellaneous Incoming Letter	01891033.PDF	162021	no	4
			6e80301690ae694820214117d530ed8efb9fbb52		
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30406	no	2
			f53acc755aa92a777a2a339ec550e50ccc42ba9a		
Warnings:					
Information:					
Total Files Size (in bytes):			620226		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>		Docket Number (Optional) <b>821920-1032</b>
Application Number <b>13/493,491</b>	Filed <b>June 11, 2012</b>	
For <b>REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT</b>		
Art Unit <b>1761</b>	Examiner <b>Hardee, John R.</b>	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ _____
<input checked="" type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ <b>300.00</b>
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ _____
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.  
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☒ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to  
Deposit Account Number 20-0778.

☒ Payment made via EFS-Web.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant.

☒ attorney or agent of record. Registration number 29,526.

☐ attorney or agent acting under 37 CFR 1.34. Registration number \_\_\_\_\_.

/Todd Deveau/

Signature

August 26, 2013

Date

Todd Deveau

Typed or printed name

770-933-9500

Telephone Number

**NOTE:** This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below\*.

☐ \* Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



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<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875	Application or Docket Number <b>13/493,491</b>	Filing Date <b>06/11/2012</b>	<input type="checkbox"/> To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

**APPLICATION AS AMENDED – PART II**

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	08/26/2013	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X \$40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	X \$210 =	0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE						<b>0</b>	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE  
/JAMES TUNSTALL/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/493,491	06/11/2012	INV001Kenneth M. Ponder	821920-1032	1039
24504 7590 03/25/2013 THOMAS I HORSTEMEYER, LLP 400 INTERSTATE NORTH PARKWAY SE SUITE 1500 ATLANTA, GA 30339			EXAMINER HARDEE, JOHN R	
			ART UNIT 1761	PAPER NUMBER
			NOTIFICATION DATE 03/25/2013	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@tkhr.com  
kristen.layton@tkhr.com  
ozzie.liggins@tkhr.com

<b>Office Action Summary</b>	<b>Application No.</b> 13/493,491	<b>Applicant(s)</b> PONDER ET AL.	
	<b>Examiner</b> JOHN HARDEE	<b>Art Unit</b> 1761	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 5) ☒ Claim(s) 30-46 is/are pending in the application.
- 5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 30-46 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

\* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

#### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 11 June 2012 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 06112012.
- 3) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 4) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of 35 U.S.C. 112(b):

(B) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 30-43 are rejected under 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claims merely setting forth physical characteristics desired in article, and not setting forth specific compositions which would meet such characteristics, are invalid as vague, indefinite, and functional since they cover any conceivable combination of ingredients either presently existing or which might be discovered in future and which would impart desired characteristics; thus, expression “a liquefiable substance having a liquefaction temperature from about 40 °C. to about 300 °C. and being compatible with the ingredients in the powdered detergent composition” is too broad and indefinite since it purports to cover everything which will perform the desired functions regardless of its composition, and, in effect, recites compounds by what it is desired that they do rather than what they are.—Ex parte Slob (PO BdApp) 157 USPQ 172.

### ***Claim Scope and Interpretation***

3. At p. 13 of the specification, applicant states that the compositions of interest possess the characteristics recited in claim 1. Figure 1 shows characteristics for compositions containing 40/60, 45/55 and 42/58 blends of tetrafluoroethane and pentafluoroethane, respectively. Compositions comprising these percentages of these

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refrigerants were searched and examined, in the absence of any percentage limitations in claims 30-43.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 30-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takigawa et al., US 6,207,071. The reference discloses lubricating oil compositions and their use in compositions comprising R134a and R125 (col. 1, lines 13+). The reference further discloses the use of hydrofluorocarbons as replacements for chlorofluorocarbons (col. 1, lines 20+). Suitable lubricants include the alkylbenzene oils described at col. 2, lines 30+. Refrigerants include alkane fluorides containing 40% or more of R134a in admixture with alkyl fluorides containing, most preferably, 40% or more of R125 (col. 8, lines 20+). The reference further discloses that there is “no restriction as to the kind of HFC to be mixed with” the disclosed refrigerants. The examiner takes the position that this can reasonably be construed to mean that no additional HFC need be added, and that the disclosure reads on refrigerant compositions *consisting of* 40-60% R134a and 60-40% of R125. Conventional additives may be added, including those disclosed at the top of col. 8. The examiner takes the position that anticorrosion additives are conventional, and that their use would be obvious over this disclosure. Lubricant compositions comprising naphthenic mineral oil and polyol polyesters are disclosed in Table 1. Note the disclosure in Evaluation Tests 2 and 3 of refrigerant being premixed with lubricant prior to charging a compressor. The disclosed lubricating refrigerant compositions are useful in a variety of refrigeration apparatus, as disclosed at the top of col. 9. Determination of the lubrication-effective amount of a disclosed lubricant amounts to routine optimization. This reference differs from the claimed subject matter in that it does not disclose a composition which reads on appellant’s claims with sufficient specificity to constitute anticipation.

It would have been obvious at the time the invention was made to make such a composition, because this reference teaches that all of the ingredients recited by appellants are suitable for inclusion in a refrigerant composition. The person of ordinary skill in the refrigeration art would expect the recited compositions to have properties similar to those compositions which are exemplified, absent a showing to the contrary.

In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed Cir. 1990).

8. No additional art was cited with this office action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, Dr. John R. Hardee, whose telephone number is (571) 272-1318. The examiner can normally be reached on Monday through Friday from 8:00 until 4:30. In the event that the examiner is not available, his supervisor, Mr. Harold Pyon, may be reached at (571) 272-1498.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/John R. Hardee/  
Primary Examiner  
March 19, 2013



<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2012-06-11
	First Named Inventor	Kenneth M. Ponder	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	821920-1032	

U.S. PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	6207071		2001-03-27	Takigawa et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S. PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2</sup>	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1							<input type="checkbox"/>

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NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>5</sup>

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		2012-06-11
First Named Inventor	Kenneth M. Ponder	
Art Unit		
Examiner Name		
Attorney Docket Number	821920-1032	

1		<input type="checkbox"/>
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**EXAMINER SIGNATURE**

Examiner Signature	/John R. Hardee/	Date Considered	03/19/2013
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2012-06-11
First Named Inventor	Kenneth M. Ponder
Art Unit	
Examiner Name	
Attorney Docket Number	821920-1032

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached certification statement.
- ☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Todd Deveau/	Date (YYYY-MM-DD)	2012-06-11
Name/Print	Todd Deveau	Registration Number	29526


This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

<b>Search Notes</b>  	<b>Application/Control No.</b>  13493491	<b>Applicant(s)/Patent Under Reexamination</b>  PONDER ET AL.
	<b>Examiner</b>  JOHN HARDEE	<b>Art Unit</b>  1761

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
PALM invetor search. Reviewed prosecution history and searches in parent cases.	3/19/13	JRH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/493,491	06/11/2012	Kenneth M. Ponder	821920-1032

**CONFIRMATION NO. 1039**

## PUBLICATION NOTICE



\*OC000000056784648\*

24504  
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP  
400 INTERSTATE NORTH PARKWAY SE  
SUITE 1500  
ATLANTA, GA 30339

**Title:**REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

**Publication No.**US-2012-0240602-A1

**Publication Date:**09/27/2012

## NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at [www.uspto.gov](http://www.uspto.gov). The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

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In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at [www.uspto.gov](http://www.uspto.gov) using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

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Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875						Application or Docket Number 13/493,491				
<b>APPLICATION AS FILED - PART I</b>										
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	95		N/A				
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	310		N/A				
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	125		N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	17	minus 20 = *	x 30 =	0.00	OR					
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3	minus 3 = *	x 125 =	0.00						
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00						
			TOTAL	530		TOTAL				
* If the difference in column 1 is less than zero, enter "0" in column 2.										
<b>APPLICATION AS AMENDED - PART II</b>										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
13/493,491	06/11/2012	1761	530	821920-1032	17	3

CONFIRMATION NO. 1039

24504

THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP  
400 INTERSTATE NORTH PARKWAY SE  
SUITE 1500  
ATLANTA, GA 30339

FILING RECEIPT



\*OC000000054942449\*

Date Mailed: 06/22/2012

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

**Applicant(s)**

Kenneth M. Ponder, Cumming, GA;  
Steffan Thomas JR., Buckhead, GA;

**Power of Attorney:** The patent practitioners associated with Customer Number 24504

**Domestic Priority data as claimed by applicant**

This application is a CON of 12/961,045 12/06/2010 PAT 8197706 \*  
which is a CON of 10/937,736 09/08/2004 ABN  
which claims benefit of 60/501,049 09/08/2003  
(\*)Data provided by applicant is not consistent with PTO records.

**Foreign Applications** (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)

**If Required, Foreign Filing License Granted:** 06/19/2012

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/493,491**

**Projected Publication Date:** 09/27/2012

**Non-Publication Request:** No

**Early Publication Request:** No

**\*\* SMALL ENTITY \*\***



**Title**

REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

**Preliminary Class**

252

**PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Kenneth M. Ponder, et al.

Confirmation No.: Unknown

Group Art Unit: Unknown

Serial No.: Concurrently Filed Herewith

Examiner: Unknown

Filed: June 4, 2012

Docket No.: 821920-1032

For: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

**INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

This information disclosure statement is filed in accordance with 37 C.F.R. §§ 1.56, 1.97, and 1.98, and specifically:

☒ under 37 CFR 1.97(b), or  
(within Three months of filing national application; or date of entry of international application;  
or before mailing date of first office action on the merits; whichever occurs last)

☐ under 37 CFR 1.97(c) together with either a:  
☐ Statement Under 37 C.F.R. 1.97(e), or  
☐ a \$180.00 fee under 37 CFR 1.17(p).  
(After the CFR 1.97(b) time period, but before the final office action or notice of allowance, whichever occurs first)

☐ under 37 CFR 1.97(d) together with a:  
☐ Statement under 37 CFR 1.97(e), and  
☐ a \$180.00 petition fee set forth in 37 CFR 1.17(p).  
(Filed after final office action or notice of allowance, whichever occurs first, but before payment of the issue fee)

☐ Enclosed is a check in the amount of \$\_\_\_\_\_.

☐ Payment by credit card. 06/19/2012 SSOK11 00000023 200778 13493491

☐ Please charge \$180.00 to deposit account 20-0778:2311

01 FC:4011	95.00 DA
02 FC:2111	310.00 DA
03 FC:2311	125.00 DA

☒ At any time during the pendency of this application, please charge any fees required to Deposit Account 20-0778 pursuant to 37 CFR 1.25. The Commissioner is hereby requested to credit any overpayment to Deposit Account No. 20-0778.

☒ Applicant(s) submit herewith *Form PTO SB/08A-08B-08a - Information Disclosure Statement by Applicant* together with copies (where required) of patents, publications or other information of which

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Kenneth M. Ponder, et al.

Confirmation No.: Unknown

Group Art Unit: Unknown

Serial No.: Concurrently Filed Herewith

Examiner: Unknown

Filed: June 11, 2012

Docket No.: 821920-1032

For: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

In regard to the above-referenced application, the Applicant submits the following preliminary amendment and remarks to be respectively entered and considered prior to examination.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to Deposit Account No. 20-0778.

## IN THE SPECIFICATION

Amend the title as follows:

~~ENVIRONMENTALLY SAFER REPLACEMENT REFRIGERANT WITH NAPHTHENIC  
LUBRICATING OIL FOR REFRIGERANT REPLACEMENT OF R22-BASED REFRIGERATION  
SYSTEMS REFRIGERANT~~

Amend the specification as follows:

Page 1, line 6 replace with:

This application is a continuation of U.S. Patent Application serial number 12/961,045 filed December 6, 2010, which is a continuation of U.S. Patent Application serial number 10/937,736 filed September 8, 2004, which claims priority to and the benefit of provisional application, Serial No. 60/501,049 filed September 8, 2003.

Page 11, line 19 replace with:

In an exemplary embodiment, the invention provides ~~[[an]]~~a cylinder can like the standard 25 or 30 lb. can formerly used for containing "Refrigerant R-22 (chlorodifluoromethane)," but containing about 58% by weight 1,1,1,2-tetrafluoroethane and about 42% by weight pentafluoroethane. The can also contains the preferred lubricant, ROYCO® 2302 in solution with the coolant mixture at a percent by weight of between 0.5% and 2%.

Page 13, line 13 replace with:

Fig. 1 shows Pressure (liquid) vs. Temperature profiles for R-22 and blends of ~~60/40, 55/45~~ and ~~58/42~~ 40/60, 45/55 and 42/58 of tetrafluoroethane and pentafluoroethane, respectively.

Fig. 2 shows Temperature vs. Enthalpy profiles comparing a blend of ~~60/40~~ 40/60 tetrafluoroethane and pentafluoroethane to R-22.

### **IN THE CLAIMS**

Please amend the claims to read as follows wherein changes are shown by strikethrough for deleted matter and underlining for added matter.

1 - 29.(Cancelled)

30. (New) In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethanes wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

31. (New) In the apparatus of claim 30, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F.

32. (New) A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute refrigerant composition designed to achieve a phase change and comprising a combination of refrigerant gases, the refrigerant gases consisting

of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F,

(2) supplying a the substitute refrigerant composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

(3) adding to said apparatus via the manifold the substitute refrigerant composition for chlorodifluoromethane, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

33. (New) The method of claim 32, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F.

34. (New) A refrigerant composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and

pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

35. (New) The refrigerant composition of claim 34, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F.

36. (New) The refrigerant composition according to claim 34, wherein the lubricating oil includes an additive selected from the group consisting of further includes an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

37. (New) In the apparatus of claim 30, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

38. (New) In the apparatus of claim 30, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.

39. (New) The method according to claim 32, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.

40. (New) The method according to claim 32, wherein the lubricating oil includes an additive selected from the group consisting of an acrylic polymer, a corrosion inhibit, a surfactant, a foaming agent, and mixtures thereof.



41. (New) In the apparatus of claim 30, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
42. (New) The method of claim 32, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
43. (New) The refrigerant composition of claim 34, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
44. (New) In the apparatus of claim 41, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.
45. (New) The method according to claim 42, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.
46. (New) The refrigerant composition according to claim 43, wherein said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

## REMARKS

Applicant has amended the specification, relating to the priority claim and Figs. 1 and 2, and encloses a Substitute Specification. It is believed that the foregoing amendment adds no new matter to the present application.

Applicant respectfully requests that this application and all presently pending claims be allowed to issue. If the Examiner has any questions or comments regarding Applicant's response, the Examiner is encouraged to telephone Applicant's undersigned counsel.

Respectfully submitted ,

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## SUBSTITUTE SPECIFICATION

REFRIGERANT WITH LUBRICATING OIL FOR  
REPLACEMENT OF R22 REFRIGERANT**RELATED APPLICATION**

5

This application, mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof is a continuation of U.S. Patent Application serial number 12/961,045 filed December 6, 2010, which is a continuation of U.S. Patent Application serial number 10/937,736 filed September 8, 2004, which claims priority to and the benefit of  
10 provisional application, Serial No. 60/501,049 filed September 8, 2003.

**BACKGROUND OF THE INVENTION**

## 1. Field Of The Invention

The present invention relates to the replacement of Refrigerant R-22 (chlorodifluoromethane) refrigerant with a blend refrigerant that is less damaging to the  
15 ozone layer in systems designed to use Refrigerant R-22 (chlorodifluoromethane). More particularly the present invention relates to an improved refrigerant composition, method and apparatus for refrigeration wherein two non-Refrigerant R-22 refrigerants are mixed in a defined ratio such that the temperature-pressure relationship of the mix approximates that of Refrigerant R-22 (chlorodifluoromethane). The mixture is compatible with  
20 Refrigerant R-22 (chlorodifluoromethane) so that it can be added to supplement and replace Refrigerant R-22 (chlorodifluoromethane). A further particularity of the instant invention relates to an improved method and apparatus for refrigeration wherein refrigerant mixture is mixed with a soluble lubricating oil to provide lubrication to the apparatus. The lubricant is soluble in both the mixture of the invention and Refrigerant  
25 R-22 (chlorodifluoromethane) refrigerant.

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## 2. General Background

Until recently, R-22 refrigerant chlorodifluoromethane (hereinafter sometimes called “Refrigerant R-22 (chlorodifluoromethane)”) was the major, if not sole refrigerant, used in residential air-conditioners, refrigerators, freezers and window air-conditioning units. Refrigerant R-22 (chlorodifluoromethane) is a trademark of E. I. du Pont de Nemours & Co. Inc. for chlorodifluoromethane. Hereinafter, “Refrigerant R-22 (chlorodifluoromethane)” is used in this specification to denote chlorodifluoromethane, regardless of the source.

Recently, however, Refrigerant R-22 (chlorodifluoromethane) has come under attack both nationally and internationally as an ozone layer-damaging chemical. In recent years, both the national and international scientific communities have linked Refrigerant R-22 (chlorodifluoromethane) with damage to the earth’s protective ozone layer. Air-conditioners, refrigerator/freezers and window air-conditioning units containing R-22 are believed to be a global source of ozone-damaging material.

In response to scientific concern and a national and global outcry over the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning, the United States Congress has acted to first reduce and then ban the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning units.

As a first step toward phasing out the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning units, Congress is phasing out the use of Refrigerant R-22 (chlorodifluoromethane) in new equipment effective 01/01/2015 and has banned the sale of Refrigerant R-22 (chlorodifluoromethane) in any size container as of 01/01/2020. One of the first areas in which the use of Refrigerant R-22 (chlorodifluoromethane) is to be phased out is in the Bakery industry under the Bakery Partnership Program. Another step in phasing out the use of R-22 is the import restrictions that begin in 2003, limiting the amount of R-22 that can be imported into the United States.

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At the time of this application, the vast majority of residential, window units and freezers in use in the United States contain Refrigerant R-22 (chlorodifluoromethane).

Prior to banning the sale of quantities of Refrigerant R-22 (chlorodifluoromethane), owners of equipment with Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning units are able to purchase the level of refrigerant in their equipment with only the need of a refrigerants license as required by the Clean Air Act. Millions of units containing refrigerant R-22 (chlorodifluoromethane) were sold in the United States prior to the start of mandatory phase out set forth by Congress and the international community.

Refrigerant R-22 (chlorodifluoromethane) recharging typically involves 30 lb. cans or cylinders typically used in the HVAC/R industry. The cylinders are fitted with a dispensing outlet compatible with a commercially available refrigeration manifold. In order to recharge an air-conditioning system, a customer need to only fit the can or cylinder to the manifold and discharge, or “add to” the refrigerant charge directly into the air conditioning system.

Following Congress’s ban on the sale of Refrigerant R-22 (chlorodifluoromethane) millions of equipment owners with Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning units will be left with no choice other than to seek replacement refrigerants to service these units. Intentionally mixing of refrigerants is currently illegal by standards set forth by the Clean Air Act. An example would be for this application is that current R-22 units could not be mixed with this invention intentionally.

In response to Congress’s ban on the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning, service dealers have begun to retrofit existing Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning units with new, non-R-22 refrigerants, such as R410A (a 50/50 mixture of difluoromethane and pentafluoroethane), R417 (a 46/50/4 mixture of pentafluoroethane, 1,1,1,2-

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tetrafluoroethane, and butane) or R407C (a 23/25/52 mixture of difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane). None of these replacements contain a lubricant when produced.

5 The refrigerants that will be authorized by the Environmental Protection Agency (EPA) to replace Refrigerant R-22 (chlorodifluoromethane) in air conditioners is currently under review and will evolve to require an environmentally safe refrigerant, with a 0 odp factor like the one of the present invention described herein. Unfortunately, most replacements for R-22 have a markedly different temperature-pressure relationship at most operating temperatures than Refrigerant R-22 (chlorodifluoromethane).

10 Because of this difference in the temperature-pressure relationship of Refrigerant R-22 (chlorodifluoromethane) and current replacement refrigerants, existing Refrigerant R-22 (chlorodifluoromethane)-based systems cannot typically be interchanged. Hence, non-retrofitted, Refrigerant R-22 (chlorodifluoromethane)-based units have a need for a refrigerant that will fulfill the requirements of the system design while also meeting the  
15 requirements of the EPA and the international community.

Simply mixing refrigerants with existing Refrigerant R-22 (chlorodifluoromethane) in order to replenish, or “topping off” the level is against the law and not feasible. When other refrigerants are mixed with Refrigerant R-22 (chlorodifluoromethane), the mixture can take on the pressure characteristics of a  
20 substance that could be harmful to either the equipment or the operator. The temperature-pressure relationship becomes markedly different from that of Refrigerant R-22 (chlorodifluoromethane) at temperatures within the normal refrigerant operating temperature range and typical use of R-22.

Hence, in the absence of Refrigerant R-22 (chlorodifluoromethane) owners of  
25 equipment with Refrigerant R-22 (chlorodifluoromethane)-based air conditioners face but one choice when the level of their air-conditioning coolant is low: professional service—

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at a significant cost—to remove the existing Refrigerant R-22 (chlorodifluoromethane), and retrofit the system compatible with some kind of refrigerant gas.

R-22 refrigerants were developed to replace the prior, now banned R-12 refrigerant, or dichlorodifluoromethane. R-12 is sometimes referred to as FREON 12®,  
5 which is a trademark of E.I. du Pont de Nemours & Co. for dichlorodifluoromethane.

Thomas et al. (U.S. Pat. No. 5,254,280) discloses a lubricant developed for use with a refrigerant known as R134a (1,1,1,2 – tetrafluoroethane) and the combination of that lubricant with a refrigerant, which is a replacement for R-12. The lubricant contains polyoxyalkylene glycol, which is hydrophilic and could damage the system as discussed  
10 below.

Wilczek (U.S. Pat. No. 5,384,057), Gorski (U.S. Pat. No. 4,971,712), and Anton of DuPont (U.S. Pat. No. 5,145,594) disclose other R-12 replacements in the form of a blend of certain synthetic lubricants in various R134a and R134a/R125 refrigerant systems. The DuPont patents discuss a gas known as R125 (pentafluoroethane). R125 is  
15 five fluorine atoms bonded to an ethane molecule. This is a very large molecule for a refrigerant. It is currently being produced for refrigeration only. Anton discloses the use of a lubricant comprising at least one cyanocarbon compound. Wilczek discloses a fluorosiloxane as a lubricant. Gorski discloses a polyalkylene glycol as a lubricant.

Systems that contain R-22, or R-12 replacements, are still being produced today.  
20 These older systems have common components: R-22, R-22 mineral oil lubricant, and water that is sequestered into the dryer. If R134a (1,1,1,2-tetrafluoroethane) were added to the system, it would damage the system as follows: (1) if no lubricant is added to the R134a (as in U.S. Pat. No. 4,953,312 to Tamura et al.), then the R-22 system would be starved for lubricant, since the R134a gas is not miscible with the mineral oil lubricant;  
25 (2) if a synthetic lubricant is added to the R134a (as in Thomas et al.), then there is a different problem—that of moisture. Older systems can have water trapped in their dryers. The synthetic lubricants (such as polyglycol- or polysiloxane-based lubricants)

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are hydrophilic. Thus, they are not only miscible with R-22 and R134a; they are also partially or completely miscible with water. Thus, if they are introduced into an R-22 system, they will pull this water out of the dryer into the refrigerant flow, initiating corrosion and damage to pressure switches and the TX valve and possible other system components. This is why Elf Atochem and DuPont, to name a few publish elaborate flushing procedures and high efficiency dryer change-outs to prevent damage to the cooling system.

Weber (U.S. Patent No. 5,942,149) discloses yet another R-12 replacement consisting of a blend of chlorodifluoroethane, tetrafluoroethane and a naphthenic lubricating oil.

**SUMMARY OF THE PRESENT DISCLOSURE**

The present disclosure is of a method and apparatus that are environmentally sound alternatives to the use of Refrigerant R-22 (chlorodifluoromethane) as a refrigerant. More particularly, the invention provides a mixture of at least two refrigerants that are miscible with each other, and compatible with Refrigerant R-22 (chlorodifluoromethane) while at the same time possessing a temperature-pressure profile that approximates that of Refrigerant R-22 (chlorodifluoromethane) over the operating range of ambient temperatures usually encountered by air conditioning units or other apparatus utilizing Refrigerant R-22 (chlorodifluoromethane) as a refrigerant. The invention also provides a lubricant, that is compatible with both the environmentally sound refrigerant of the invention and with Refrigerant R-22 (chlorodifluoromethane), so that mixtures of the refrigerant according to the invention and Refrigerant R-22 (chlorodifluoromethane) may be utilized with this lubricant in the refrigeration systems without deleterious effect upon moving parts of the refrigerating apparatus that require lubrication from the refrigerant.

More particularly, the refrigerant and method disclosed herein involves a mixture of pentafluoroethane and tetrafluoroethane in specific proportions that provide a



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temperature-pressure relationship that approximates that of Refrigerant R-22 (chlorodifluoromethane) over the range of ambient temperature operating conditions in which Refrigerant R-22 (chlorodifluoromethane) is a useful refrigerant. The pentafluoroethane/tetrafluoroethane refrigerant blend disclosed herein is compatible with both synthetic and mineral oils. The tetrafluoroethane can be either 1,1,1,2-tetrafluoroethane or 1,1,2,2-tetrafluoroethane. In an exemplary embodiment, the refrigerant according to the invention comprises a ratio of from about 40 to about 45 weight percent pentafluoroethane to about 55 to about 60 percent 1,1,1,2-tetrafluoroethane, based upon the total weight of pentafluoroethane and 1,1,1,2-tetrafluoroethane. In a further exemplary embodiment, the refrigerant includes the ratio of about 42 weight percent pentafluoroethane to about 58 weight percent 1,1,1,2-tetrafluoroethane.

In addition, the refrigerant according to the invention also includes from about 0 to about 20 weight percent (based on the combined weight of pentafluoroethane and 1,1,1,2-tetrafluoroethane) of a lubricating oil that is soluble in chlorodifluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane. In a preferred embodiment the lubricating oil is present in the range of from about 0.5 to about 2% by weight of the refrigerant mixture.

In an exemplary embodiment, the lubricating oil is a napthenic or paraffinic based lubricating oil. In a further exemplary embodiment, the lubricant is selected from those lubricants sold by Anderol, Inc., East Hanover, N.J., an affiliate of Royal Lubricants Company, under the trademark ROYCO® 2302. ROYCO® 2302 is a napthenic oil lubricant having the following composition:

65-85% hydrotreated light napthenic distillate,  
10-20% solvent refined light napthenic distillate petroleum,  
<0.5% butylated triphenyl phosphate, and  
<2% minor additive.

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In another exemplary embodiment, the lubricating oil can be a synthetic lubricating oil, or a mixture of oils, that is soluble in the mixture of the chlorodifluoroethane and tetrafluoroethane. A suitable synthetic lubricant is a man-made, synthetic alkyl aromatic lubricant. Suitable synthetic lubricants include alkylated  
5 benzene lubricants.

The lubricant can be either a synthetic alkyl aromatic lubricant, such as alkylbenzene, alone, or a mixture of a synthetic alkyl aromatic lubricant and mineral oil or a mixture of a synthetic alkyl aromatic lubricant and polyol ester (POE). When so mixed, it is preferred, but not required, that a minor portion of the mixture be mineral oil  
10 or POE. By minor portion, we mean less than 50% by weight of the blended refrigerants. Alternatively, either mineral oil or polyol ester (POE) can be used alone.

While it is intended that the substitute refrigerant according to the invention may be utilized to replace Refrigerant R-22 (chlorodifluoromethane) that has escaped from apparatus, the substitute refrigerant of the invention may also be utilized to completely  
15 refill apparatus that have been designed for use with Refrigerant R-22 (chlorodifluoromethane), since the refrigerant has a temperature-pressure profile that closely approximates that of Refrigerant R-22 (chlorodifluoromethane). Thus, when the refrigerant is used as a complete replacement for Refrigerant R-22 (chlorodifluoromethane), it is no longer necessary that the lubricant be compatible with  
20 chlorodifluoromethane but only that it should be compatible with 1,1,1,2-tetrafluoroethane and pentafluoroethane.

Further, whereas the substitute refrigerant of the invention is less damaging to the ozone layer than Refrigerant R-22 (chlorodifluoromethane) and is useful in air conditioning units, and in particular residential type air-conditioning units, it is not so  
25 limited in its use. Indeed, the refrigerant may be utilized as a substitute or replacement for Refrigerant R-22 (chlorodifluoromethane) in virtually any application, thereby eliminating the use of ozone layer-damaging Refrigerant R-22 (chlorodifluoromethane).

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In further specifics, the invention provides a canister containing a mixture of tetrafluoroethane and pentafluoroethane with a napthenic oil that may be fitted with an outlet manifold that is compatible with a Refrigerant R-22 (chlorodifluoromethane) recharging manifold that is typically used to recharge an apparatus with the latter  
5 refrigerant. Refrigerant may then be allowed to flow from the container through the manifold and into the apparatus to replace Refrigerant R-22 (chlorodifluoromethane) refrigerant that has been lost from the refrigeration system.

When mixing the components of the refrigerant blend of the present invention, one should first mix the lubricant with the tetrafluoroethane, then mix that mixture with  
10 the pentafluoroethane in the proportions afore mentioned. Otherwise, the product does not mix properly.

In an exemplary form, the lubricant has a viscosity of 5 to 500 centistokes, more preferably 5 to 100 centistokes, even more preferably 5 to 50 centistokes, and most preferably 5 to 10 centistokes. The lubricant having a viscosity of 5 to 10 centistokes is  
15 preferred.

In an exemplary embodiment, the percentage by weight of lubricant in the refrigerant blend is 0-20%, preferably 0.5-2%, more preferably 1-2%, even more preferably 1.25-2%, and most preferably 1.5-1.75%. The percentage by weight of lubricant in the refrigerant blend is, for example, 1.75.  $\pm$ 0.05%.

20 A suitable lubricant is severely hydro treated napthenic/paraffinic lubricant, such as the aforementioned ROYCO® 2302. Other suitable lubricants include Sunpar R2280 (a paraffinic based lubricant), Lubrizol 403, Sunthene 200 (a napthenic based lubricant) and L30 or L35 from Shrieve Chemical Company, The Woodlands, Texas, or Zerol 150 from Nu-Calgon Wholesale, Inc., St. Louis, Missouri, or AB150 from Virginia KMP  
25 Corporation, Dallas, Texas (alkylbenzene synthetic lubricants). Mobil One 5-weight synthetic oil (it is hydrophobic) could also work as a lubricant, but it is relatively expensive.

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In order for the parts of the refrigerant system to function best, 0.5-20% of total weight of refrigerant should be lubricant. When adding the refrigerant blend to a refrigerant system, one should leave the lubricant in the system if one for some reason takes out the Refrigerant R-22.

- 5           The lubricating of the present system is miscible with the pentafluoroethane and tetrafluoroethane blend and with R-22 refrigerant. This allows for mixing of residual R-22 refrigerant and the refrigerant of the present invention, without the release of significant amounts of residual water in the dryer and subsequent system damage (as will happen if the synthetic lubricants disclosed in Thomas et al. and the DuPont patents are used).
- 10       While alkylbenzene alone is considered not miscible with tetrafluoroethane (in particular R134a), it is sufficiently soluble in the present tetrafluoroethane/chlorodifluoroethane mixture. This solubility allows the replacement refrigerant blend to lubricate the system, preventing damage to the compressor and component parts of the system.

- Various optional additives can be included in the lubricant. A corrosion inhibitor
- 15       can be included. (otherwise corrosion will probably occur within 6 months). An exemplary corrosion inhibitor is one for anhydrous systems (such corrosion inhibitors comprise calcium, or phosphate salts). The corrosion inhibitor can be bonded to the lubricant. Additionally, a surfactant and/or a foaming agent can be included.

- The present refrigerant blend is designed to be utilized as a R-22 replacement in
- 20       refrigeration systems. It is designed as a replacement, in which little or no modifications including parts are used to adapt the system for the refrigerant of the present invention.

- The present refrigerant blend can be used as a replacement for R-22 refrigerant, typically deminimus without retrofitting the air conditioning system or flushing it out. It is recommended that a full vacuum be obtained before adding the refrigerant to the
- 25       present invention.

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**BRIEF DESCRIPTION OF THE DRAWINGS**

Many aspects of the disclosure can be better understood with reference to the following drawings.

FIG. 1 illustrates pressure versus temperature profiles for various blends of the present disclosure in comparison to R-22.

FIG. 2 compares the temperature versus enthalpy profile of an exemplary embodiment of the present disclosure to R-22.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

The present disclosure provides a mixture of non-Refrigerant 22 refrigerants that are less damaging to the Earth's ozone layer and that are approved by the U.S. Environmental Protection Agency for use in air-conditioners. The invention mixture is compatible with Refrigerant R-22 (chlorodifluoromethane) and can be used to replace existing Refrigerant R-22 (chlorodifluoromethane)-in R-22 based refrigeration systems. It is expected that the present invention will gradually replace Refrigerant R-22 (chlorodifluoromethane) in Refrigerant R-22 (chlorodifluoromethane)-based air-cooling systems, without the need to retrofit existing Refrigerant R-22 (chlorodifluoromethane)-based systems for non-Refrigerant 22 replacement refrigerants.

Specifically, the present refrigerant blend includes a mixture of pentafluoroethane and tetrafluoroethane packaged with a compatible lubricating oil, provided under pressure in a can or cylinder equipped with an outlet compatible with existing Refrigerant R-22 (chlorodifluoromethane) recharging kit manifolds, so that the refrigerant and lubricant mixture can be added to existing Refrigerant R-22 (chlorodifluoromethane) based coolant systems. Also, the invention provides the possibility of using new refrigerant systems, originally designed for "Refrigerant R-22 (chlorodifluoromethane)," by supplying an EPA-approved refrigerant so that retrofitting to new equipment use is not required.

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In an exemplary embodiment, the invention provides a cylinder can like the standard 25 or 30 lb. can formerly used for containing "Refrigerant R-22 (chlorodifluoromethane)," but containing about 58% by weight 1,1,1,2-tetrafluoroethane and about 42% by weight pentafluoroethane. The can also contains the preferred  
5 lubricant, ROYCO® 2302 in solution with the coolant mixture at a percent by weight of between 0.5% and 2%.

Existing Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning systems use an amount of a vegetable or hydrocarbon mineral oil to lubricate the compressor. This oil has a very low vapor pressure, and is not soluble with pure  
10 tetrafluoroethane, particularly 1,1,1,2-tetrafluoroethane. Hence, adding tetrafluoroethane to replace Refrigerant R-22 (chlorodifluoromethane) in existing Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning systems leads to compressor breakdown from lack of sufficient lubrication. The invention provides lubricants that are compatible with the invention mixture of tetrafluoroethane and pentafluoroethane, and with  
15 "Refrigerant R-22 (chlorodifluoromethane)," and that are suitable for lubricating refrigerant compressors and other air-conditioner component parts. The lubricants disclosed herein, on the other hand, are soluble in a tetrafluoroethane/ pentafluoroethane mixture. This solubility allows the replacement refrigerant blend to lubricate the air-conditioning system, preventing damage to the compressor and component parts of the  
20 system.

## EXAMPLE 1

Table 1 summarizes the results of solubility tests of a 2% by weight solution of ROYCO® 2302 oil lubricant in an 58/42% by weight mixture of 1,1,1,2-tetrafluoroethane and pentafluoroethane refrigerants. ROYCO® 2302 oil (available from  
25 ANDEROL®, Inc., an affiliate of Royal Lubricants Co.), was added to a clear Fisher-Porter pressure burette and a mixture of 1,1,1,2-tetrafluoroethane/pentafluoroethane in an 58/42 ratio by weight was introduced under pressure to maintain the liquid state.

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TABLE 1

	Full Burette	clear no separation
	2/3 Full Burette	clear no separation
5	1/2 Full Burette	clear no separation
	1/3 Full Burette	clear no separation
	Almost Empty Burette	clear no separation

Note: The color of the fluid remained the same as the burette was emptied. The expelled  
 10 gas deposited the oil onto a test panel.

## EXAMPLE 2

1,1,1,2-tetrafluoroethane and pentafluoroethane are mixed with the napthenic oil lubricant at set ratios such that the temperature-pressure profile of the mixture is similar to that of Refrigerant R-22 (chlorodifluoromethane), over the normal operating range of  
 15 air-conditioners. Table 2 summarizes the results of tests of the temperature-pressure profiles of various mixes of 1,1,1,2-tetrafluoroethane and pentafluoroethane over the range of normal air-conditioner working temperatures, from -60 degree. F. to 160. degree. F.

For Table 2, different percentages of 1,1,1,2-tetrafluoroethane and  
 20 pentafluoroethane --by weight--were mixed with the lubricant to show the pressure temperature relationships of the various invention combinations.

Fig. 1 shows Pressure (liquid) vs. Temperature profiles for R-22 and blends of 40/60, 45/55 and 42/58 of tetrafluoroethane and pentafluoroethane, respectively.

Fig. 2 shows Temperature vs. Enthalpy profiles comparing a blend of 40/60  
 25 tetrafluoroethane and pentafluoroethane to R-22.

The blend of refrigerants tetrafluoroethane and pentafluoroethane of the present disclosure shows the following properties of interest:

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Dew Point @ -32F

Bubble Point @ -41.5F

Glide @ 9.5 F

5 An exemplary blend of refrigerants is about 42% by weight pentafluoroethane and about 58% by weight 1,1,1,2-tetrafluoroethane. This is the ratio of pentafluoroethane to 1,1,1,2-tetrafluoroethane with the lubricant where the mixture of the invention shows the greatest similarity to "Refrigerant R-22 (chlorodifluoromethane)", over most operating temperatures.

10 The apparatus and method of the preferred embodiment encompass the use of a mixture of 1,1,1,2-tetrafluoroethane and pentafluoroethane at the ranges, as discussed above, with a lubricating oil at ranges, as discussed above of about 0.5% to about 2% by weight in the operation of an air-conditioning system, wherein the coolant-oil mixture replaces Refrigerant R-22 (chlorodifluoromethane) in a Refrigerant R-22 (chlorodifluoromethane)-based refrigeration system.

15 The method and apparatus in the preferred embodiment further details providing the above described mix of pentafluoroethane/1,1,1,2-tetrafluoroethane and lubricating oil in 30 lb. cylinders, where the cylinders are pressure sealed and fitted with an outlet compatible for existing Refrigerant 22-type refrigeration manifolds typically ¼ inch male flare.

20 Further, it was noted that the systems tested ran more smoothly and the compressor showed less vibration during the test period, as the mixture of the invention was added. It is theorized that the lubricating oil, being soluble in the refrigerant gasses, was better able to lubricate the compressor and reciprocating parts than the existing Refrigerant R-22 (chlorodifluoromethane) lubricant used by itself. In some applications a  
25 reduction in power consumption maybe also noted.



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The refrigerant of the present invention can also be used as a replacement refrigerant for the new R-22 air-conditioning systems, such as the systems used in today's HFC-free units

5 The ROYCO® 2302 naphthenic oil lubricant of the present disclosure has a flash point of more than 150 degrees F. Pure refrigerant 1,1,1,2-tetrafluoroethane is not miscible with a naphthenic lubricant like mineral oil or mineral seal oil (both of which could be used as the lubricants of the present invention). Pentafluoroethane is miscible with most naphthenic lubricants, including mineral oils. The presence of the pentafluoroethane allows the use of mineral oils in the refrigerant blend and system of the present invention (a translucent, partially miscible blend is formed). The lubricant can  
10 advantageously be partially polymerized into longer chain molecules to allow it to function at very low percentage levels. The lubricant can be hydrotreated or polymerized for stability and wear resistance.

Phosphated additives add corrosion resistance in the presence of acids and salts  
15 and increase wear resistance. Calcium additives help the lubricant resist rust and the effects of corrosion; calcium salts reduce the corrosive effects of hydrochloric acid that is formed in the presence of water and the chlorinated gases present in the refrigerant systems of the present invention.

The ROYCO® lubricants mentioned above contain the corrosion inhibitors  
20 mentioned above and can also contain acrylic polymer. It is believed that the function of the acrylic polymer is to increase wear resistance under severe conditions. Acrylics can help film formation, and the ability of the lubricant to coat metal and soft parts and stay in place.

The lubricant of the present invention is miscible with R-22, the R-22 lubricant,  
25 and the blend of the refrigerant gases of the present invention.

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It should be understood that variations and modifications may be made of the invention herein taught, and that those are within the scope and spirit of the invention as taught above and claimed here below.

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Table 2

Temp (F)	P (60-40)	P (58-42)	P (55-45)	P (R-22)
-60	8.982	8.81	8.552	8.836
-55	10.36	10.16	9.87	10.19
-50	11.9	11.68	11.35	11.7
-45	13.62	13.37	12.99	13.39
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110	245.3	242.2	237.6	241.1
115	262	258.7	253.9	257.5
120	279.6	276.1	271	274.7
125	298.1	294.4	289	292.7
130	317.5	313.6	307.8	311.6
135	337.8	333.7	327.6	331.4
140	359.1	354.8	348.3	352.1
145	381.4	376.8	370.1	373.7
150	404.8	400	392.8	396.4
155	429.3	424.2	416.7	420
160	454.9	449.5	441.6	444.7

## SUBSTITUTE SPECIFICATION

**Claims**

What is claimed as the invention is:

1 - 29.(Cancelled)

5

30. (New) In an apparatus designed for use with chlorodifluoromethane refrigerant, the improvement comprising substituting the chlorodifluoromethane with a refrigerant composition designed to achieve a phase change, the refrigerant composition comprising a combination of refrigerant gases, said refrigerant gases consisting of a blend of  
10 tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and  
15 is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethanes wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

31. (New) In the apparatus of claim 30, wherein the blend exhibits a dew point at about  
20 -32°F and a bubble point at about -41.5°F.

32. (New) A method for refilling an apparatus designed for use with a chlorodifluoromethane refrigerant, the method comprising:

(1) selecting a substitute refrigerant composition designed to achieve a phase  
25 change and comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F,

## SUBSTITUTE SPECIFICATION

(2) supplying a the substitute refrigerant composition under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

5 (3) adding to said apparatus via the manifold the substitute refrigerant composition for chlorodifluoromethane, wherein the refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from  
10 the group consisting of mineral oil, synthetic alkyl aromatic lubricants, and mixtures thereof.

33. (New) The method of claim 32, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F.

15 34. (New) A refrigerant composition comprising a combination of refrigerant gases, the refrigerant gases consisting of a blend of tetrafluoroethane and pentafluoroethane, the ratio of the tetrafluoroethane to the pentafluoroethane being selected such that the blend exhibits a dew point at about -32°F or a bubble point at about -41.5°F, wherein the  
20 refrigerant composition further comprises non-refrigerant gas components, said non-refrigerant gas components including a lubricating oil, wherein the lubricating oil is present up to about 20% by weight of the refrigerant gases and is soluble in chlorodifluoromethane, tetrafluoroethane and pentafluoroethane, wherein the lubricating oil is selected from the group consisting of mineral oil, synthetic alkyl aromatic  
25 lubricants, and mixtures thereof.

35. (New) The refrigerant composition of claim 34, wherein the blend exhibits a dew point at about -32°F and a bubble point at about -41.5°F.

## SUBSTITUTE SPECIFICATION

36. (New) The refrigerant composition according to claim 34, wherein the lubricating oil includes an additive selected from the group consisting of further includes an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.
- 5 37. (New) In the apparatus of claim 30, wherein the apparatus is selected from the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.
38. (New) In the apparatus of claim 30, wherein the lubricating oil includes an additive  
10 selected from the group consisting of an acrylic polymer, a corrosion inhibitor, a surfactant, a foaming agent, and mixtures thereof.
39. (New) The method according to claim 32, wherein the apparatus is selected from  
15 the group consisting of refrigeration equipment, air-conditioning equipment, and HVAC equipment.
40. (New) The method according to claim 32, wherein the lubricating oil includes an  
20 additive selected from the group consisting of an acrylic polymer, a corrosion inhibit, a surfactant, a foaming agent, and mixtures thereof.
41. (New) In the apparatus of claim 30, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.
42. (New) The method of claim 32, wherein the tetrafluoroethane is 1,1,1,2-  
25 tetrafluoroethane.
43. (New) The refrigerant composition of claim 34, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.

## SUBSTITUTE SPECIFICATION

44. (New) In the apparatus of claim 41, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.
- 5 45. (New) The method according to claim 42, wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.
- 10 46. (New) The refrigerant composition according to claim 43, wherein said pentafluoroethane is present in the ratio of about 58% by weight to said tetrafluoroethane present in an amount of about 42% by weight.

## SUBSTITUTE SPECIFICATION

**ABSTRACT**

An apparatus and method wherein potential ozone layer-damaging chlorodifluoromethane (Refrigerant R-22) is substituted with a mix of less environmentally damaging refrigerants pentafluoroethane and tetrafluoroethane in chlorodifluoromethane-based air-cooling systems mainly in residential cooling. While less environmentally damaging than chlorodifluoromethane, the substitute refrigerant has a temperature-pressure relationship similar to that of chlorodifluoromethane, making the substitute refrigerant suitable for use with chlorodifluoromethane-based air-cooling systems. In this event, it is mixed with a relatively small percentage of a lubricating oil which is compatible with both the unit refrigerant and typical R-22 system design.





RX TIME 12/22/04 14:40

LOCATION: 770770599

## DECLARATION FOR PATENT APPLICATION

Attorney Docket No: 821920-1030

As the below named inventor(s), I/we hereby declare that:

Our residences, post office addresses and citizenships are as stated below next to our names.

We believe we are the original, first, and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled **Environmentally Safer Replacement Refrigerant with Naphthenic Oil for Refrigerant R22-Based Refrigeration Systems**, the specification of which:

- ☐ is attached hereto.  
☒ was filed on September 8, 2004 as Application Serial No. 10/937,736.  
☐ was filed on \_\_\_\_\_ under U.S. Express Mail No. \_\_\_\_\_;  
☐ is set forth in PCT International Application No. \_\_\_\_\_;  
filed on \_\_\_\_\_ and as amended Under PCT Article 19 on \_\_\_\_\_ (if any).

I/we hereby state that I/we have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I/we acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I/we hereby claim foreign priority benefits under Title 35, United States Code, 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America listed below and have also identified below any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed: **NOT APPLICABLE**.

I/we hereby appoint all attorneys and agents of Thomas, Kayden, Horstemeyer & Risley, LLP, who are listed under the USPTO Customer Number shown below as my/our attorneys and agents to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith, recognizing that the specific attorneys and agents listed under that Customer Number may be changed from time to time at the sole discretion of Thomas, Kayden, Horstemeyer & Risley, LLP, and request that all correspondence be addressed to the address filed under the same USPTO Customer Number.

**24504**

Please address all telephone calls, in the first instance, to **Todd Deveau** at telephone number: (770) 933-9500.

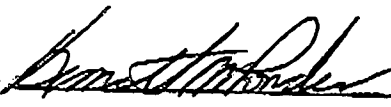
Address all correspondence to:

**Todd Deveau**  
**THOMAS, KAYDEN, HORSTEMEYER**  
**& RISLEY, L.L.P.**  
100 Galleria Parkway, N.W., Suite 1750  
Atlanta, Georgia 30339-5948

Page 1 of 3

Docket No. 821920-1030

I/we hereby declare that all statements made herein of my/our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statement and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of First Inventor: Kenneth M PonderResidence: 105 Highland View Drive, Cumming, Georgia 30040 US Citizenship: USPost Office Address: 105 Highland View Drive, Cumming, Georgia 30040 USInventor's Signature: Date: 12/22/04

Full Name of Second Inventor: Steffan Thomas, Jr.

Residence: 4250 Bethany Road, Buckhead, Georgia US

Citizenship: US

Post Office Address: 4250 Bethany Road, Buckhead, Georgia US

Inventor's Signature: Steffan Thomas, Jr.

Date: 12/22/04

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Kenneth M. Ponder, et al.

Confirmation No.: Unknown

Group Art Unit: Unknown

Serial No.: Concurrently Filed Herewith

Examiner: Unknown

Filed: June 4, 2012

Docket No.: 821920-1032

For: REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT

**INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

This information disclosure statement is filed in accordance with 37 C.F.R. §§ 1.56, 1.97, and 1.98, and specifically:

☒ under 37 CFR 1.97(b), or  
(within Three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; whichever occurs last)

☐ under 37 CFR 1.97(c) together with either a:  
☐ Statement Under 37 C.F.R. 1.97(e), or  
☐ a \$180.00 fee under 37 CFR 1.17(p).  
(After the CFR 1.97(b) time period, but before the final office action or notice of allowance, whichever occurs first)

☐ under 37 CFR 1.97(d) together with a:  
☐ Statement under 37 CFR 1.97(e), and  
☐ a \$180.00 petition fee set forth in 37 CFR 1.17(p).  
(Filed after final office action or notice of allowance, whichever occurs first, but before payment of the issue fee)

☐ Enclosed is a check in the amount of \$\_\_\_\_\_.

☐ Payment by credit card.

☐ Please charge \$180.00 to deposit account 20-0778.

☒ At any time during the pendency of this application, please charge any fees required to Deposit Account 20-0778 pursuant to 37 CFR 1.25. The Commissioner is hereby requested to credit any overpayment to Deposit Account No. 20-0778.

☒ Applicant(s) submit herewith *Form PTO SB/08A-08B-08a - Information Disclosure Statement by Applicant* together with copies (where required) of patents, publications or other information of which

applicant(s) are aware, which applicant(s) believe(s) may or may not be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56. As required by 37 C.F.R. §1.98(a), a legible copy of each document is provided.

- ☐ A concise explanation of the relevance of foreign language patents, foreign language publications and other foreign language information listed on PTO Form SB/08A-08B-08a, as presently understood by the individual(s) designated in 37 CFR 1.56(c) most knowledgeable about the content is given on the attached sheet, or where a foreign language patent is cited in a search report or other action by a foreign patent office in a counterpart foreign application, an English language version of the search report or action which indicates the degree of relevance found by the foreign office is listed on the form PTO SB/08A-08B-08a and is enclosed herewith.

The following rights are reserved by the Applicant(s): the right to establish the patentability of the claimed invention over any of the listed documents should they be applied as reference, and/or the right to prove that some of these documents may not be prior art, and/or the right to prove that some of these documents may not be enabling for the teachings they purport to offer.

This statement should not be construed as a representation that an exhaustive search has been made, or that information more material to the examination of the present application does not exist. Any statements or identifications regarding the relevance of any portion(s) of cited references should not be construed as a representation that the most relevant portion(s) have been identified, and the absence of such statements or identifications should not be construed as representations that there are no relevant portion(s). The Examiner is specifically requested not to rely solely on the materials submitted herewith. The Examiner is requested to conduct an independent and thorough review of the documents, and to form independent opinions as to their significance.

It is requested that the information disclosed herein be made of record in this application and that the Examiner initial and return a copy of the enclosed PTO SB/08A-08B-08a to indicate the documents have been considered.

Respectfully submitted,

**THOMAS, KAYDEN, HORSTEMEYER  
& RISLEY, LLP**

By: /Todd Deveau/  
**Todd Deveau**  
**Registration No. 29,526**

400 Interstate North Parkway SE  
Suite 1500  
Atlanta, Georgia 30339  
Phone: 770.933.9500  
Email: todd.deveau@tkhr.com

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2012-06-11
	First Named Inventor	Kenneth M. Ponder	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	821920-1032	

U.S. PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	6207071		2001-03-27	Takigawa et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S. PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2</sup>	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1							<input type="checkbox"/>

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>5</sup>

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		2012-06-11
First Named Inventor	Kenneth M. Ponder	
Art Unit		
Examiner Name		
Attorney Docket Number	821920-1032	

1		<input type="checkbox"/>
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If you wish to add additional non-patent literature document citation information please click the Add button

**EXAMINER SIGNATURE**

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2012-06-11
First Named Inventor	Kenneth M. Ponder
Art Unit	
Examiner Name	
Attorney Docket Number	821920-1032

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached certification statement.
- ☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Todd Deveau/	Date (YYYY-MM-DD)	2012-06-11
Name/Print	Todd Deveau	Registration Number	29526

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**



## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	12983192
<b>Application Number:</b>	13493491
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1039
<b>Title of Invention:</b>	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT
<b>First Named Inventor/Applicant Name:</b>	Kenneth M. Ponder
<b>Customer Number:</b>	24504
<b>Filer:</b>	Todd Deveau./Amy Kwon
<b>Filer Authorized By:</b>	Todd Deveau.
<b>Attorney Docket Number:</b>	821920-1032
<b>Receipt Date:</b>	11-JUN-2012
<b>Filing Date:</b>	
<b>Time Stamp:</b>	16:06:47
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	01634576.PDF	1034573 <small>3057784572232480c653d882a6e5a2682307fd31</small>	no	5

### Warnings:

**Information:** [Case 5:20-cv-00142-FL](#) [Document 153-8](#) [Filed 06/04/21](#) [Page 350 of 383](#) 349

2	Drawings-only black and white line drawings	01634562.PDF	361092	no	1
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Information:					
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	Multipart Description/PDF files in .zip description				
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	Specification		1	16	
	Claims		17	22	
	Abstract		23	23	
Warnings:					
Information:					
4	Preliminary Amendment	01640932.PDF	80959	no	7
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Warnings:					
Information:					
5		01640938.PDF	150784	yes	22
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	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	17	
	Claims		18	21	
	Abstract		22	22	
Warnings:					
Information:					
6	Oath or Declaration filed	01640227.PDF	103242	no	3
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Warnings:					
Information:					

7	Transmittal Letter	01640873.PDF	100293 ddb6e3046bd22b68b9173353bcbae438bde4aba9	no	2
<b>Warnings:</b>					
<b>Information:</b>					
8	Information Disclosure Statement (IDS) Form (SB08)	01640864.PDF	65793 ba6e33af5475d918094150d4ba46a035af22cd7a	no	4
<b>Warnings:</b>					
<b>Information:</b>					
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<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	821920-1032
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
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<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>	
	Kenneth	M.	Ponder		
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<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	821920-1032	
		Application Number		
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
Customer Number	24504			
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Title of the Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT			
Attorney Docket Number	821920-1032	Small Entity Status Claimed <input checked="" type="checkbox"/>		
Application Type	Nonprovisional			
Subject Matter				
Suggested Class (if any)		Sub Class (if any)		
Suggested Technology Center (if any)				
Total Number of Drawing Sheets (if any)	1	Suggested Figure for Publication (if any)		

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Prior Application Status	Pending	<input type="button" value="Remove"/>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	12961045	2010-12-06
Prior Application Status	Abandoned	<input type="button" value="Remove"/>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	10/937786	2004-02-09

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	821920-1032
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		
Prior Application Status	Expired	<a href="#">Remove</a>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	60/501049	2003-09-08
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Signature	/Todd Deveau/			Date (YYYY-MM-DD)	2012-06-11
First Name	Todd	Last Name	Deveau	Registration Number	29526

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	821920-1032
		Application Number	
Title of Invention	REFRIGERANT WITH LUBRICATING OIL FOR REPLACEMENT OF R22 REFRIGERANT		

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FIG. 1

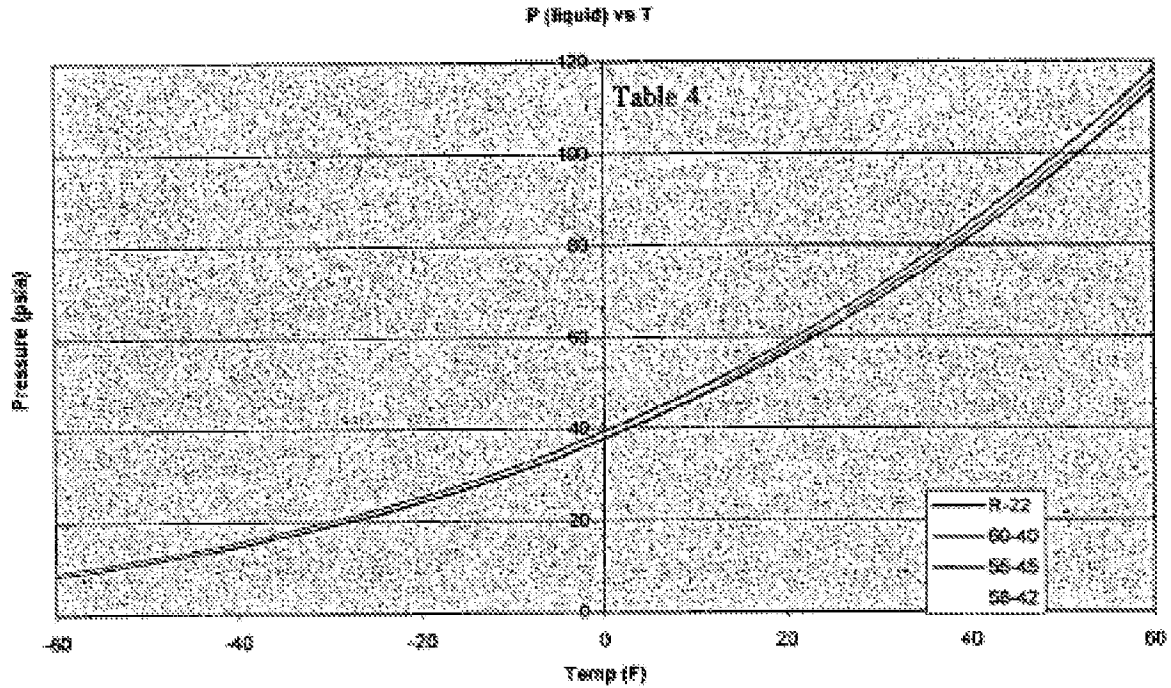
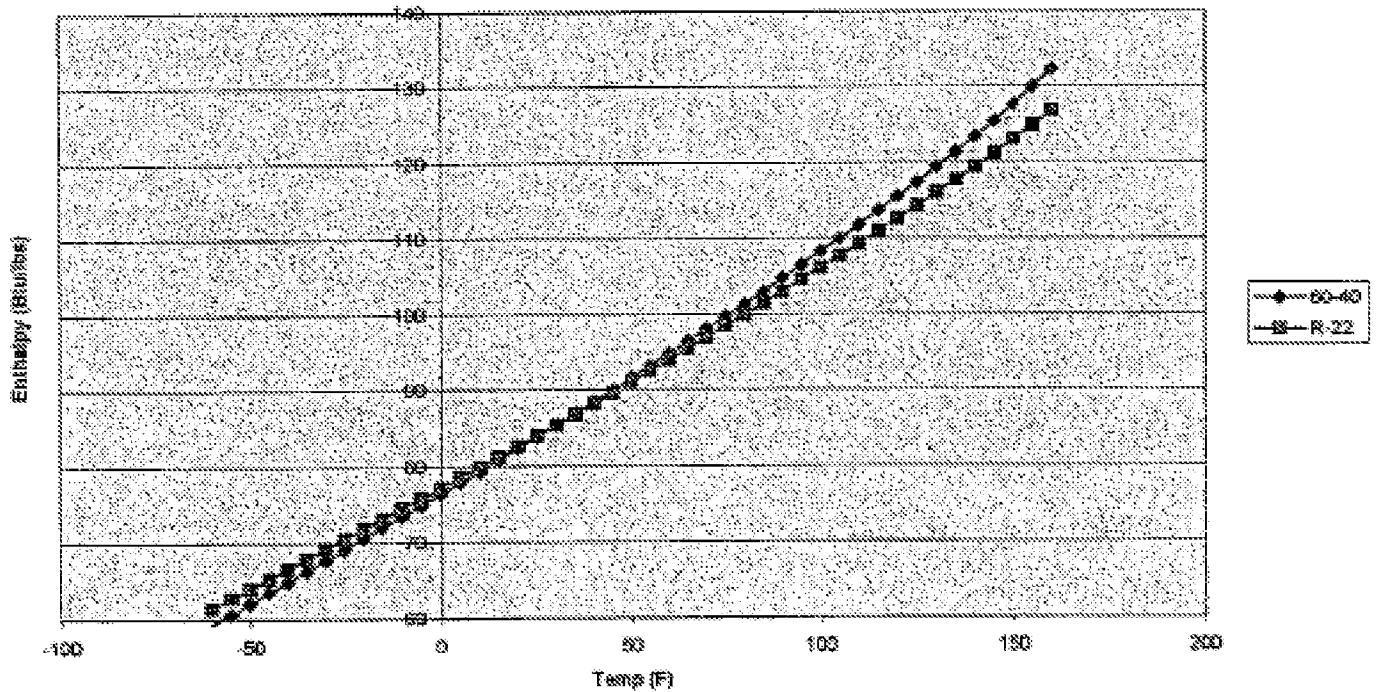


FIG. 2  
Temp vs Enthalpy



# ENVIRONMENTALLY SAFER REPLACEMENT REFRIGERANT WITH NAPHTHENIC OIL FOR REFRIGERANT R22-BASED REFRIGERATION SYSTEMS

## RELATED APPLICATION

5

This application claims priority to and the benefit of provisional application, Serial No. 60/501,049 filed September 8, 2003.

## BACKGROUND OF THE INVENTION

### 1. Field Of The Invention

10       The present invention relates to the replacement of Refrigerant R-22 (chlorodifluoromethane) refrigerant with a blend refrigerant that is less damaging to the ozone layer in systems designed to use Refrigerant R-22 (chlorodifluoromethane). More particularly the present invention relates to an improved refrigerant composition, method and apparatus for refrigeration wherein two non-Refrigerant R-22 refrigerants are mixed  
15       in a defined ratio such that the temperature-pressure relationship of the mix approximates that of Refrigerant R-22 (chlorodifluoromethane). The mixture is compatible with Refrigerant R-22 (chlorodifluoromethane) so that it can be added to supplement and replace Refrigerant R-22 (chlorodifluoromethane). A further particularity of the instant invention relates to an improved method and apparatus for refrigeration wherein  
20       refrigerant mixture is mixed with a soluble lubricating oil to provide lubrication to the apparatus. The lubricant is soluble in both the mixture of the invention and Refrigerant R-22 (chlorodifluoromethane) refrigerant.

### 2. General Background

25       Until recently, R-22 refrigerant chlorodifluoromethane (hereinafter sometimes called "Refrigerant R-22 (chlorodifluoromethane)") was the major, if not sole refrigerant, used in residential air-conditioners, refrigerators, freezers and window air-conditioning units. Refrigerant R-22 (chlorodifluoromethane) is a trademark of E. I. du Pont de Nemours & Co. Inc. for chlorodifluoromethane. Hereinafter, "Refrigerant R-22

(chlorodifluoromethane)” is used in this specification to denote chlorodifluoromethane, regardless of the source.

Recently, however, Refrigerant R-22 (chlorodifluoromethane) has come under attack both nationally and internationally as an ozone layer-damaging chemical. In recent years, both the national and international scientific communities have linked Refrigerant R-22 (chlorodifluoromethane) with damage to the earth’s protective ozone layer. Air-conditioners, refrigerator/freezers and window air-conditioning units containing R-22 are believed to be a global source of ozone-damaging material.

In response to scientific concern and a national and global outcry over the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning, the United States Congress has acted to first reduce and then ban the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning units.

As a first step toward phasing out the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning units, Congress is phasing out the use of Refrigerant R-22 (chlorodifluoromethane) in new equipment effective 01/01/2015 and has banned the sale of Refrigerant R-22 (chlorodifluoromethane) in any size container as of 01/01/2020. One of the first areas in which the use of Refrigerant R-22 (chlorodifluoromethane) is to be phased out is in the Bakery industry under the Bakery Partnership Program. Another step in phasing out the use of R-22 is the import restrictions that begin in 2003, limiting the amount of R-22 that can be imported into the United States.

At the time of this application, the vast majority of residential, window units and freezers in use in the United States contain Refrigerant R-22 (chlorodifluoromethane).

Prior to banning the sale of quantities of Refrigerant R-22 (chlorodifluoromethane), owners of equipment with Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning units are able to purchase the level of refrigerant in their equipment with only the need of a refrigerants license as required by

the Clean Air Act. Millions of units containing refrigerant R-22 (chlorodifluoromethane) were sold in the United States prior to the start of mandatory phase out set forth by Congress and the international community.

Refrigerant R-22 (chlorodifluoromethane) recharging typically involves 30 lb. cans or cylinders typically used in the HVAC/R industry. The cylinders are fitted with a dispensing outlet compatible with a commercially available refrigeration manifold. In order to recharge an air-conditioning system, a customer need to only fit the can or cylinder to the manifold and discharge, or “add to” the refrigerant charge directly into the air conditioning system.

Following Congress’s ban on the sale of Refrigerant R-22 (chlorodifluoromethane) millions of equipment owners with Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning units will be left with no choice other than to seek replacement refrigerants to service these units. Intentionally mixing of refrigerants is currently illegal by standards set forth by the Clean Air Act. An example would be for this application is that current R-22 units could not be mixed with this invention intentionally.

In response to Congress’s ban on the use of Refrigerant R-22 (chlorodifluoromethane) in air-conditioning, service dealers have begun to retrofit existing Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning units with new, non-R-22 refrigerants, such as R410A (a 50/50 mixture of difluoromethane and pentafluoroethane), R417 (a 46/50/4 mixture of pentafluoroethane, 1,1,1,2-tetrafluoroethane, and butane) or R407C (a 23/25/52 mixture of difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane). None of these replacements contain a lubricant when produced.

The refrigerants that will be authorized by the Environmental Protection Agency (EPA) to replace Refrigerant R-22 (chlorodifluoromethane) in air conditioners is currently under review and will evolve to require a environmentally safe refrigerant, with

a 0 odp factor like the one of the present invention described herein. Unfortunately, most replacements for R-22 have a markedly different temperature-pressure relationship at most operating temperatures than Refrigerant R-22 (chlorodifluoromethane).

Because of this difference in the temperature-pressure relationship of Refrigerant  
5 R-22 (chlorodifluoromethane) and current replacement refrigerants, existing Refrigerant R-22 (chlorodifluoromethane)-based systems cannot typically be interchanged. Hence, non-retrofitted, Refrigerant R-22 (chlorodifluoromethane)-based units have a need for a refrigerant that will fulfill the requirements of the system design while also meeting the requirements of the EPA and the international community.

10 Simply mixing refrigerants with existing Refrigerant R-22 (chlorodifluoromethane) in order to replenish, or “toping off” the level is against the law and not feasible. When other refrigerants are mixed with Refrigerant R-22 (chlorodifluoromethane), the mixture can take on the pressure characteristics of a substance that could be harmful to either the equipment or the operator. The  
15 temperature-pressure relationship becomes markedly different from that of Refrigerant R-22 (chlorodifluoromethane) at temperatures within the normal refrigerant operating temperature range and typical use of R-22.

Hence, in the absence of Refrigerant R-22 (chlorodifluoromethane) owners of equipment with Refrigerant R-22 (chlorodifluoromethane)-based air conditioners face but  
20 one choice when the level of their air-conditioning coolant is low: professional service—at a significant cost—to remove the existing Refrigerant R-22 (chlorodifluoromethane), and retrofit the system compatible with some kind of refrigerant gas.

R-22 refrigerants were developed to replace the prior, now banned R-12 refrigerant, or dichlorodifluoromethane. R-12 is sometimes referred to as FREON 12®,  
25 which is a trademark of E.I. du Pont de Nemours & Co. for dichlorodifluoromethane.

Thomas et al. (U.S. Pat. No. 5,254,280) discloses a lubricant developed for use with a refrigerant known as R134a (1,1,1,2 – tetrafluoroethane) and the combination of

that lubricant with a refrigerant, which is a replacement for R-12. The lubricant contains polyoxyalkylene glycol, which is hydrophilic and could damage the system as discussed below.

Wilczek (U.S. Pat. No. 5,384,057), Gorski (U.S. Pat. No. 4,971,712), and Anton  
5 of DuPont (U.S. Pat. No. 5,145,594) disclose other R-12 replacements in the form of a  
blend of certain synthetic lubricants in various R134a and R134a/R125 refrigerant  
systems. The DuPont patents discuss a gas known as R125 (pentafluoroethane). R125 is  
five fluorine atoms bonded to an ethane molecule. This is a very large molecule for a  
refrigerant. It is currently being produced for refrigeration only. Anton discloses the use  
10 of a lubricant comprising at least one cyanocarbon compound. Wilczek discloses a  
fluorosiloxane as a lubricant. Gorski discloses a polyakylene glycol as a lubricant.

Systems that contain R-22, or R-12 replacements, are still being produced today.  
These older systems have common components: R-22, R-22 mineral oil lubricant, and  
water that is sequestered into the dryer. If R134a (1,1,1,2-tetrafluoroethane) were added to  
15 the system, it would damage the system as follows: (1) if no lubricant is added to the  
R134a (as in U.S. Pat. No. 4,953,312 to Tamura et al.), then the R-22 system would be  
starved for lubricant, since the R134a gas is not miscible with the mineral oil lubricant;  
(2) if a synthetic lubricant is added to the R134a (as in Thomas et al.), then there is a  
different problem—that of moisture. Older systems can have water trapped in their  
20 dryers. The synthetic lubricants (such as polyglycol- or polysiloxane-based lubricants)  
are hydrophilic. Thus, they are not only miscible with R-22 and R134a; they are also  
partially or completely miscible with water. Thus, if they are introduced into an R-22  
system, they will pull this water out of the dryer into the refrigerant flow, initiating  
corrosion and damage to pressure switches and the TX valve and possible other system  
25 components. This is why Elf Atochem and DuPont, to name a few publish elaborate  
flushing procedures and high efficiency dryer change-outs to prevent damage to the  
cooling system.



Weber (U.S. Patent No. 5,942,149) discloses yet another R-12 replacement consisting of a blend of chlorodifluoroethane, tetrafluoroethane and a naphthenic lubricating oil.

### **SUMMARY OF THE PRESENT DISCLOSURE**

5           The present disclosure is of a method and apparatus that are environmentally sound alternatives to the use of Refrigerant R-22 (chlorodifluoromethane) as a refrigerant. More particularly, the invention provides a mixture of at least two refrigerants that are miscible with each other, and compatible with Refrigerant R-22 (chlorodifluoromethane) while at the same time possessing a temperature-pressure profile  
10   that approximates that of Refrigerant R-22 (chlorodifluoromethane) over the operating range of ambient temperatures usually encountered by air conditioning units or other apparatus utilizing Refrigerant R-22 (chlorodifluoromethane) as a refrigerant. The invention also provides a lubricant, that is compatible with both the environmentally sound refrigerant of the invention and with Refrigerant R-22 (chlorodifluoromethane), so  
15   that mixtures of the refrigerant according to the invention and Refrigerant R-22 (chlorodifluoromethane) may be utilized with this lubricant in the refrigeration systems without deleterious effect upon moving parts of the refrigerating apparatus that require lubrication from the refrigerant.

          More particularly, the refrigerant and method disclosed herein involves a mixture  
20   of pentafluoroethane and tetrafluoroethane in specific proportions that provide a temperature-pressure relationship that approximates that of Refrigerant R-22 (chlorodifluoromethane) over the range of ambient temperature operating conditions in which Refrigerant R-22 (chlorodifluoromethane) is a useful refrigerant. The pentafluoroethane/tetrafluoroethane refrigerant blend disclosed herein is compatible with  
25   both synthetic and mineral oils. The tetrafluoroethane can be either 1,1,1,2-tetrafluoroethane or 1,1,2,2-tetrafluoroethane. In an exemplary embodiment, the refrigerant according to the invention comprises a ratio of from about 40 to about 45 weight percent pentafluoroethane to about 55 to about 60 percent 1,1,1,2-



tetrafluoroethane, based upon the total weight of pentafluoroethane and 1,1,1,2-tetrafluoroethane. In a further exemplary embodiment, the refrigerant includes the ratio of about 42 weight percent pentafluoroethane to about 58 weight percent 1,1,1,2-tetrafluoroethane.

5           In addition, the refrigerant according to the invention also includes from about 0 to about 20 weight percent (based on the combined weight of pentafluoroethane and 1,1,1,2-tetrafluoroethane) of a lubricating oil that is soluble in chlorodifluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane. In a preferred embodiment the lubricating oil is present in the range of from about 0.5 to about 2% by weight of the  
10   refrigerant mixture.

          In an exemplary embodiment, the lubricating oil is a napthenic or paraffinic based lubricating oil. In a further exemplary embodiment, the lubricant is selected from those lubricants sold by Anderol, Inc., East Hanover, N.J., an affiliate of Royal Lubricants Company, under the trademark ROYCO® 2302. ROYCO® 2302 is a napthenic oil  
15   lubricant having the following composition:

65-85% hydrotreated light napthenic distillate,  
10-20% solvent refined light napthenic distillate petroleum,  
<0.5% butylated triphenyl phosphate, and  
<2% minor additive.

20           In another exemplary embodiment, the lubricating oil can be a synthetic lubricating oil, or a mixture of oils, that is soluble in the mixture of the chlorodifluoroethane and tetrafluoroethane. A suitable synthetic lubricant is a man-made, synthetic alkyl aromatic lubricant. Suitable synthetic lubricants include alkylated benzene lubricants.

25           The lubricant can be either a synthetic alkyl aromatic lubricant, such as alkylbenzene, alone, or a mixture of a synthetic alkyl aromatic lubricant and mineral oil

or a mixture of a synthetic alkyl aromatic lubricant and polyol ester (POE). When so mixed, it is preferred, but not required, that a minor portion of the mixture be mineral oil or POE. By minor portion, we mean less than 50% by weight of the blended refrigerants. Alternatively, either mineral oil or polyol ester (POE) can be used alone.

5           While it is intended that the substitute refrigerant according to the invention may be utilized to replace Refrigerant R-22 (chlorodifluoromethane) that has escaped from apparatus, the substitute refrigerant of the invention may also be utilized to completely refill apparatus that have been designed for use with Refrigerant R-22 (chlorodifluoromethane), since the refrigerant has a temperature-pressure profile that  
10       closely approximates that of Refrigerant R-22 (chlorodifluoromethane). Thus, when the refrigerant is used as a complete replacement for Refrigerant R-22 (chlorodifluoromethane), it is no longer necessary that the lubricant be compatible with chlorodifluoromethane but only that it should be compatible with 1,1,1,2-tetrafluoroethane and pentafluoroethane.

15           Further, whereas the substitute refrigerant of the invention is less damaging to the ozone layer than Refrigerant R-22 (chlorodifluoromethane) and is useful in air conditioning units, and in particular residential type air-conditioning units, it is not so limited in its use. Indeed, the refrigerant may be utilized as a substitute or replacement for Refrigerant R-22 (chlorodifluoromethane) in virtually any application, thereby  
20       eliminating the use of ozone layer-damaging Refrigerant R-22 (chlorodifluoromethane).

          In further specifics, the invention provides a canister containing a mixture of tetrafluoroethane and pentafluoroethane with a napthenic oil that may be fitted with an outlet manifold that is compatible with a Refrigerant R-22 (chlorodifluoromethane) recharging manifold that is typically used to recharge an apparatus with the latter  
25       refrigerant. Refrigerant may then be allowed to flow from the container through the manifold and into the apparatus to replace Refrigerant R-22 (chlorodifluoromethane) refrigerant that has been lost from the refrigeration system.

When mixing the components of the refrigerant blend of the present invention, one should first mix the lubricant with the tetrafluoroethane, then mix that mixture with the pentafluoroethane in the proportions afore mentioned. Otherwise, the product does not mix properly.

5           In an exemplary form, the lubricant has a viscosity of 5 to 500 centistokes, more preferably 5 to 100 centistokes, even more preferably 5 to 50 centistokes, and most preferably 5 to 10 centistokes. The lubricant having a viscosity of 5 to 10 centistokes is preferred.

10           In an exemplary embodiment, the percentage by weight of lubricant in the refrigerant blend is 0-20%, preferably 0.5-2%, more preferably 1-2%, even more preferably 1.25-2%, and most preferably 1.5-1.75%. The percentage by weight of lubricant in the refrigerant blend is, for example, 1.75.  $\pm$ 0.05%.

15           A suitable lubricant is severely hydro treated naphthenic/paraffinic lubricant, such as the aforementioned ROYCO® 2302. Other suitable lubricants include Sunpar R2280 (a paraffinic based lubricant), Lubrizol 403, Sunthene 200 (a naphthenic based lubricant) and L30 or L35 from Shrieve Chemical Company, The Woodlands, Texas, or Zerol 150 from Nu-Calgon Wholesale, Inc., St. Louis, Missouri, or AB150 from Virginia KMP Corporation, Dallas, Texas (alkylbenzene synthetic lubricants). Mobil One 5-weight synthetic oil (it is hydrophobic) could also work as a lubricant, but it is relatively  
20           expensive.

          In order for the parts of the refrigerant system to function best, 0.5-20% of total weight of refrigerant should be lubricant. When adding the refrigerant blend to a refrigerant system, one should leave the lubricant in the system if one for some reason takes out the Refrigerant R-22.

25           The lubricating of the present system is miscible with the pentafluoroethane and tetrafluorethane blend and with R-22 refrigerant. This allows for mixing of residual R-22 refrigerant and the refrigerant of the present invention, without the release of significant

amounts of residual water in the dryer and subsequent system damage (as will happen if the synthetic lubricants disclosed in Thomas et al. and the DuPont patents are used). While alkylbenzene alone is considered not miscible with tetrafluoroethane (in particular R134a), it is sufficiently soluble in the present tetrafluoroethane/chlorodifluoroethane mixture. This solubility allows the replacement refrigerant blend to lubricate the system, preventing damage to the compressor and component parts of the system.

Various optional additives can be included in the lubricant. A corrosion inhibitor can be included. (otherwise corrosion will probably occur within 6 months). An exemplary corrosion inhibitor is one for anhydrous systems (such corrosion inhibitors comprise calcium, or phosphate salts). The corrosion inhibitor can be bonded to the lubricant. Additionally, a surfactant and/or a foaming agent can be included.

The present refrigerant blend is designed to be utilized as a R-22 replacement in refrigeration systems. It is designed as a replacement, in which little or no modifications including parts are used to adapt the system for the refrigerant of the present invention.

The present refrigerant blend can be used as a replacement for R-22 refrigerant, typically deminimus without retrofitting the air conditioning system or flushing it out. It is recommended that a full vacuum be obtained before adding the refrigerant to the present invention.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Many aspects of the disclosure can be better understood with reference to the following drawings.

FIG. 1 illustrates pressure versus temperature profiles for various blends of the present disclosure in comparison to R-22.

FIG. 2 compares the temperature versus enthalpy profile of an exemplary embodiment of the present disclosure to R-22.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

The present disclosure provides a mixture of non-Refrigerant 22 refrigerants that are less damaging to the Earth's ozone layer and that are approved by the U.S. Environmental Protection Agency for use in air-conditioners. The invention mixture is compatible with Refrigerant R-22 (chlorodifluoromethane) and can be used to replace existing Refrigerant R-22 (chlorodifluoromethane)-in R-22 based refrigeration systems. It is expected that the present invention will gradually replace Refrigerant R-22 (chlorodifluoromethane) in Refrigerant R-22 (chlorodifluoromethane)-based air-cooling systems, without the need to retrofit existing Refrigerant R-22 (chlorodifluoromethane)-based systems for non-Refrigerant 22 replacement refrigerants.

Specifically, the present refrigerant blend includes a mixture of pentafluoroethane and tetrafluoroethane packaged with a compatible lubricating oil, provided under pressure in a can or cylinder equipped with an outlet compatible with existing Refrigerant R-22 (chlorodifluoromethane) recharging kit manifolds, so that the refrigerant and lubricant mixture can be added to existing Refrigerant R-22 (chlorodifluoromethane) based coolant systems. Also, the invention provides the possibility of using new refrigerant systems, originally designed for "Refrigerant R-22 (chlorodifluoromethane)," by supplying an EPA-approved refrigerant so that retrofitting to new equipment use is not required.

In an exemplary embodiment, the invention provides an cylinder can like the standard 25 or 30 lb. can formerly used for containing "Refrigerant R-22 (chlorodifluoromethane)," but containing about 58% by weight 1,1,1,2-tetrafluoroethane and about 42% by weight pentafluoroethane. The can also contains the preferred lubricant, ROYCO® 2302 in solution with the coolant mixture at a percent by weight of between 0.5% and 2%.

Existing Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning systems use an amount of a vegetable or hydrocarbon mineral oil to lubricate the compressor. This oil has a very low vapor pressure, and is not soluble with pure

tetrafluoroethane, particularly 1,1,1,2-tetrafluoroethane. Hence, adding tetrafluoroethane to replace Refrigerant R-22 (chlorodifluoromethane) in existing Refrigerant R-22 (chlorodifluoromethane)-based air-conditioning systems leads to compressor breakdown from lack of sufficient lubrication. The invention provides lubricants that are compatible  
 5 with the invention mixture of tetrafluoroethane and pentafluoroethane, and with “Refrigerant R-22 (chlorodifluoromethane),” and that are suitable for lubricating refrigerant compressors and other air-conditioner component parts. The lubricants disclosed herein, on the other hand, are soluble in a tetrafluoroethane/ pentafluoroethane mixture. This solubility allows the replacement refrigerant blend to lubricate the air-  
 10 conditioning system, preventing damage to the compressor and component parts of the system.

#### EXAMPLE 1

Table 1 summarizes the results of solubility tests of a 2% by weight solution of ROYCO® 2302 oil lubricant in an 58/42% by weight mixture of 1,1,1,2-  
 15 tetrafluoroethane and pentafluoroethane refrigerants. ROYCO® 2302 oil (available from ANDEROL®, Inc., an affiliate of Royal Lubricants Co.), was added to a clear Fisher-Porter pressure burette and a mixture of 1,1,1,2-tetrafluoroethane/pentafluoroethane in an 58/42 ratio by weight was introduced under pressure to maintain the liquid state.

TABLE 1

20	Full Burette	clear no separation
	2/3 Full Burette	clear no separation
	1/2 Full Burette	clear no separation
	1/3 Full Burette	clear no separation
25	Almost Empty Burette	clear no separation

Note: The color of the fluid remained the same as the burette was emptied. The expelled gas deposited the oil onto a test panel.

## EXAMPLE 2

1,1,1,2-tetrafluoroethane and pentafluoroethane are mixed with the napthenic oil lubricant at set ratios such that the temperature-pressure profile of the mixture is similar to that of Refrigerant R-22 (chlorodifluoromethane), over the normal operating range of air-conditioners. Table 2 summarizes the results of tests of the temperature-pressure profiles of various mixes of 1,1,1,2-tetrafluoroethane and pentafluoroethane over the range of normal air-conditioner working temperatures, from -60 degree. F. to 160. degree. F.

For Table 2, different percentages of 1,1,1,2-tetrafluoroethane and pentafluoroethane --by weight--were mixed with the lubricant to show the pressure temperature relationships of the various invention combinations.

Fig. 1 shows Pressure (liquid) vs. Temperature profiles for R-22 and blends of 60/40, 55/45 and 58/42 of tetrafluoroethane and pentafluoroethane, respectively.

Fig. 2 shows Temperature vs. Enthalpy profiles comparing a blend of 60/40 tetrafluoroethane and pentafluoroethane to R-22.

The blend of refrigerants tetrafluoroethane and pentafluoroethane of the present disclosure shows the following properties of interest:

Dew Point @ -32F

Bubble Point @ -41.5F

Glide @ 9.5 F

An exemplary blend of refrigerants is about 42% by weight pentafluoroethane and about 58% by weight 1,1,1,2-tetrafluoroethane. This is the ratio of pentafluoroethane to 1,1,1,2-tetrafluoroethane with the lubricant where the mixture of the invention shows the greatest similarity to "Refrigerant R-22 (chlorodifluoromethane)", over most operating temperatures.

The apparatus and method of the preferred embodiment encompass the use of a mixture of 1,1,1,2-tetrafluoroethane and pentafluoroethane at the ranges, as discussed above, with a lubricating oil at ranges, as discussed above of about 0.5% to about 2% by weight in the operation of an air-conditioning system, wherein the coolant-oil mixture  
5 replaces Refrigerant R-22 (chlorodifluoromethane) in a Refrigerant R-22 (chlorodifluoromethane)-based refrigeration system.

The method and apparatus in the preferred embodiment further details providing the above described mix of pentafluoroethane/1,1,1,2-tetrafluoroethane and lubricating oil in 30 lb. cylinders, where the cylinders are pressure sealed and fitted with an outlet  
10 compatible for existing Refrigerant 22-type refrigeration manifolds typically ¼ inch male flare.

Further, it was noted that the systems tested ran more smoothly and the compressor showed less vibration during the test period, as the mixture of the invention was added. It is theorized that the lubricating oil, being soluble in the refrigerant gasses,  
15 was better able to lubricate the compressor and reciprocating parts than the existing Refrigerant R-22 (chlorodifluoromethane) lubricant used by itself. In some applications a reduction in power consumption maybe also noted.

The refrigerant of the present invention can also be used as a replacement refrigerant for the new R-22 air-conditioning systems, such as the systems used in today's  
20 HFC-free units

The ROYCO® 2302 napthenic oil lubricant of the present disclosure has a flash point of more than 150 degrees F. Pure refrigerant 1,1,1,2-tetrafluoroethane is not miscible with a napthenic lubricant like mineral oil or mineral seal oil (both of which could be used as the lubricants of the present invention). Pentafluoroethane is miscible  
25 with most napthenic lubricants, including mineral oils. The presence of the pentafluoroethane allows the use of mineral oils in the refrigerant blend and system of the present invention (a translucent, partially miscible blend is formed). The lubricant can



advantageously be partially polymerized into longer chain molecules to allow it to function at very low percentage levels. The lubricant can be hydrotreated or polymerized for stability and wear resistance.

5       Phosphated additives add corrosion resistance in the presence of acids and salts and increase wear resistance. Calcium additives help the lubricant resist rust and the effects of corrosion; calcium salts reduce the corrosive effects of hydrochloric acid that is formed in the presence of water and the chlorinated gases present in the refrigerant systems of the present invention.

10       The ROYCO® lubricants mentioned above contain the corrosion inhibitors mentioned above and can also contain acrylic polymer. It is believed that the function of the acrylic polymer is to increase wear resistance under severe conditions. Acrylics can help film formation, and the ability of the lubricant to coat metal and soft parts and stay in place.

15       The lubricant of the present invention is miscible with R-22, the R-22 lubricant, and the blend of the refrigerant gases of the present invention.

It should be understood that variations and modifications may be made of the invention herein taught, and that those are within the scope and spirit of the invention as taught above and claimed here below.

Table 2

Temp (F)	P (60-40)	P (58-42)	P (55-45)	P (R-22)
-60	8.982	8.81	8.552	8.836
-55	10.36	10.16	9.87	10.19
-50	11.9	11.68	11.35	11.7
-45	13.62	13.37	12.99	13.39
-40	15.52	15.24	14.82	15.26
-35	17.63	17.32	16.84	17.34
-30	19.96	19.61	19.08	19.62
-25	22.52	22.13	21.54	22.14
-20	25.33	24.9	24.25	24.91
-15	28.41	27.93	27.21	27.93
-10	31.76	31.23	30.44	31.23
-5	35.42	34.83	33.96	34.82
0	39.39	38.74	37.79	38.73
5	43.69	42.98	41.94	42.96
10	48.34	47.57	46.43	47.54
15	53.36	52.52	51.27	52.48
20	58.76	57.85	56.5	57.79
25	64.57	63.58	62.11	63.51
30	70.8	69.73	68.14	69.65
35	77.48	76.33	74.61	76.22
40	84.62	83.38	81.52	83.26
45	92.25	90.9	88.91	90.76
50	100.4	98.93	96.79	98.76
55	109	107.5	105.2	107.3
60	118.2	116.6	114.1	116.3
65	128	126.2	123.6	125.9
70	138.4	136.5	133.6	136.1
75	149.3	147.3	144.3	146.9
80	160.9	158.8	155.6	158.3
85	173.2	170.9	167.5	170.4
90	186.1	183.7	180.1	183.1
95	199.8	197.2	193.3	196.5
100	214.2	211.4	207.3	210.6
105	229.3	226.4	222.1	225.5
110	245.3	242.2	237.6	241.1
115	262	258.7	253.9	257.5
120	279.6	276.1	271	274.7
125	298.1	294.4	289	292.7
130	317.5	313.6	307.8	311.6
135	337.8	333.7	327.6	331.4
140	359.1	354.8	348.3	352.1
145	381.4	376.8	370.1	373.7
150	404.8	400	392.8	396.4
155	429.3	424.2	416.7	420
160	454.9	449.5	441.6	444.7

**Claims**

What is claimed as the invention is:

- 5           1.       In an apparatus for refrigerating that is designed for use with ozone layer-damaging chlorodifluoromethane refrigerant known as R-22, the improvement comprising substituting the chlorodifluoromethane with a substitute blend refrigerant containing a lubricant less damaging to the Earth's ozone layer than chlorodifluoromethane,
- 10               said substitute refrigerant consisting of:
- about 40% to about 45% by weight pentafluoroethane;
- 15               about 55% to about 60% by weight tetrafluoroethane; and
- packaged with about 0% to about 20% by weight of the refrigerant with a lubricating oil that is soluble in chlorodifluoromethane, pentafluoroethane and
- 20               tetrafluoroethane.
2.       The invention according to Claim 1, the lubricating oil having the following components:
- 25               65-88% hydrotreated light napthenic distillate, and
- 10-20% solvent refined light napthenic distillate petroleum.
- 30           3.       The invention according to claim 1 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 40% by weight to said tetrafluoroethane present in an amount of about 60% by weight.

4. The invention according to claim 1 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 42% by weight to said tetrafluoroethane present in an amount of about 58% by weight.

5. The invention according to claim 1 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 45% by weight to said tetrafluoroethane present in an amount of about 55% by weight.

6. A method for refilling an apparatus for refrigeration that is designed for use with ozone layer-damaging chlorodifluoromethane refrigerant, the method comprising:

(1) supplying a substitute refrigerant under pressure, in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

(2) adding to said apparatus via the manifold a substitute refrigerant for chlorodifluoromethane, wherein said substitute refrigerant consists of:

about 40% to about 45% by weight pentafluoroethane ;

about 55% to about 60% by weight tetrafluoroethane; and

about 0% to about 20% by weight of the refrigerant of a lubricating oil that is soluble in chlorodifluoromethane, pentafluoroethane and tetrafluoroethane.

7. The invention according to claim 6, the lubricating oil having the following components:

65-85% hydrotreated light napthenic distillate, and

10-20% solvent refined light napthenic distillate petroleum.

8. The invention according to claim 6 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 40% by weight to said tetrafluoroethane present in an amount of about 60% by weight.

5 9. The invention according to claim 6 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 42% by weight to said tetrafluoroethane present in an amount of about 58% by weight.

10 10. The invention according to claim 6 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 45% by weight to said tetrafluoroethane present in an amount of about 55% by weight.

11. In an apparatus for air-conditioning designed for use with ozone layer-damaging chlorodifluoromethane refrigerant the improvement comprising substituting  
15 the chlorodifluoromethane with a refrigerant less damaging to the Earth's ozone layer than chlorodifluoromethane, the substitute refrigerant consisting of:

about 40% to about 45% by weight pentafluoroethane;

20 about 55% to about 60% by weight tetrafluoroethane; and

about 0% to about 20% by weight of the refrigerant of a lubricating oil that is soluble in chlorodifluoromethane, pentafluoroethane and tetrafluoroethane.

25

12. The invention according to claim 11, the lubricating oil having the following components:

65-85% hydrotreated light napthenic distillate, and

30

10-20% solvent refined light napthenic distillate petroleum.

13. The invention according to claim 11 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 42% by weight to said tetrafluoroethane present in an amount of about 58% by weight.

5 14. The invention according to claim 11 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 45% by weight to said tetrafluoroethane present in an amount of about 55% by weight.

10 15. The invention according to claim 11 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 40% by weight to said tetrafluoroethane present in an amount of about 60% by weight.

15 16. A method for refilling an apparatus for air-conditioning that is designed for use with ozone layer-damaging chlorodifluoromethane refrigerant, the method comprising:

(1) supplying a substitute refrigerant under pressure in a cylinder can fitted with an outlet compatible with a chlorodifluoromethane recharging manifold of the apparatus; and

20

(2) adding to said apparatus via the manifold the substitute refrigerant for chlorodifluoromethane, wherein said substitute refrigerant consists of:

25

about 40% to about 45% by weight pentafluoroethane ;

about 55% to about 60% by weight tetrafluoroethane; and

30

about 0% to about 20% by weight of the refrigerant of a lubricating oil that is soluble in chlorodifluoromethane, pentafluoroethane and tetrafluoroethane.

17. The invention according to claim 16, the lubricating oil having the following components:

65-85% hydrotreated light naphthenic distillate, and

10-20% solvent refined light naphthenic distillate petroleum.

18. The invention according to claim 16 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 42% by weight to said tetrafluoroethane present in an amount of about 58% by weight.

19. The invention according to claim 16 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 45% by weight to said tetrafluoroethane present in an amount of about 55% by weight.

20. The invention according to claim 16 wherein in the substitute refrigerant said pentafluoroethane is present in the ratio of about 40% by weight to said tetrafluoroethane present in an amount of about 60% by weight.

21. A refrigerant consisting of:

about 40% to about 45% by weight pentafluoroethane;

about 55% to about 60% by weight tetrafluoroethane; and

about 0% to about 20% by weight of the refrigerant of a lubricating oil that is soluble in chlorodifluoromethane, pentafluoroethane and tetrafluoroethane.

22. The invention according to claim 21, the lubricating oil having the following components:

65-85% hydrotreated light naphthenic distillate, and

10-20% solvent refined light naphthenic distillate petroleum.

23. A refrigerant according to claim 21 wherein said pentafluoroethane is present in the ratio of about 40% by weight to said tetrafluoroethane present in an amount of about 60% by weight.

5           24. A refrigerant according to claim 21 wherein said pentafluoroethane is present in the ratio of about 45% by weight to said tetrafluoroethane present in an amount of about 55% by weight with a napthenic lubricant.

10           25. A refrigerant according to claim 21 wherein said pentafluoroethane is present in the ratio of about 40% by weight to said tetrafluoroethane present in an amount of about 60% by weight with a napthenic lubricant.

15           26. The invention according to any one of claims 1, 6, 11, 16, and 21, wherein the tetrafluoroethane is 1,1,1,2-tetrafluoroethane.

20           27. The invention according to any one of claims 2, 7, 12, 17, and 22, wherein the lubricating oil further includes an acrylic polymer or a corrosion inhibitor or both.

25           28. The invention according to any one of claims 6, 11, 16, and 21, wherein the lubricating oil is selected from the group consisting of napthenic based lubricants, paraffinic based lubricants and mixtures thereof, synthetic alkyl aromatic lubricants, synthetic alkyl aromatic lubricants mixed with mineral oil, synthetic alkyl aromatic lubricants mixed with polyol ester, mineral oil, and polyol ester.

29. The invention according to claim 28, wherein the synthetic alkyl aromatic lubricant includes an alkylbenzene.



**ABSTRACT**

An apparatus and method wherein potential ozone layer-damaging chlorodifluoromethane (Refrigerant R-22) is substituted with a mix of less environmentally damaging refrigerants pentafluoroethane and tetrafluoroethane in chlorodifluoromethane-based air-cooling systems mainly in residential cooling. While less environmentally damaging than chlorodifluoromethane, the substitute refrigerant has a temperature-pressure relationship similar to that of chlorodifluoromethane, making the substitute refrigerant suitable for use with chlorodifluoromethane-based air-cooling systems. In this event, it is mixed with a relatively small percentage of a lubricating oil which is compatible with both the unit refrigerant and typical R-22 system design.

## SCORE Placeholder Sheet for IFW Content

Application Number: 13493491

Document Date: 6/11/2012

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

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<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875					Application or Docket Number <b>13/493,491</b>		Filing Date <b>06/11/2012</b>		<input type="checkbox"/> To be Mailed	
<b>APPLICATION AS FILED – PART I</b>										
(Column 1)			(Column 2)			SMALL ENTITY <input checked="" type="checkbox"/> OR		OTHER THAN SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	minus 20 =	*	X \$	=	OR	X \$	=			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$	=		X \$	=			
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.										
<b>APPLICATION AS AMENDED – PART II</b>										
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	06/11/2012	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
Total (37 CFR 1.16(i))	*	17	Minus	** 20	=	0	OR	X \$	=	
Independent (37 CFR 1.16(h))	*	3	Minus	*** 3	=	0	OR	X \$	=	
<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))										
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
					TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE		
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
Total (37 CFR 1.16(i))	*		Minus	**	=		OR	X \$	=	
Independent (37 CFR 1.16(h))	*		Minus	***	=		OR	X \$	=	
<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))										
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

Legal Instrument Examiner:  
/RUBY JOHNSON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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